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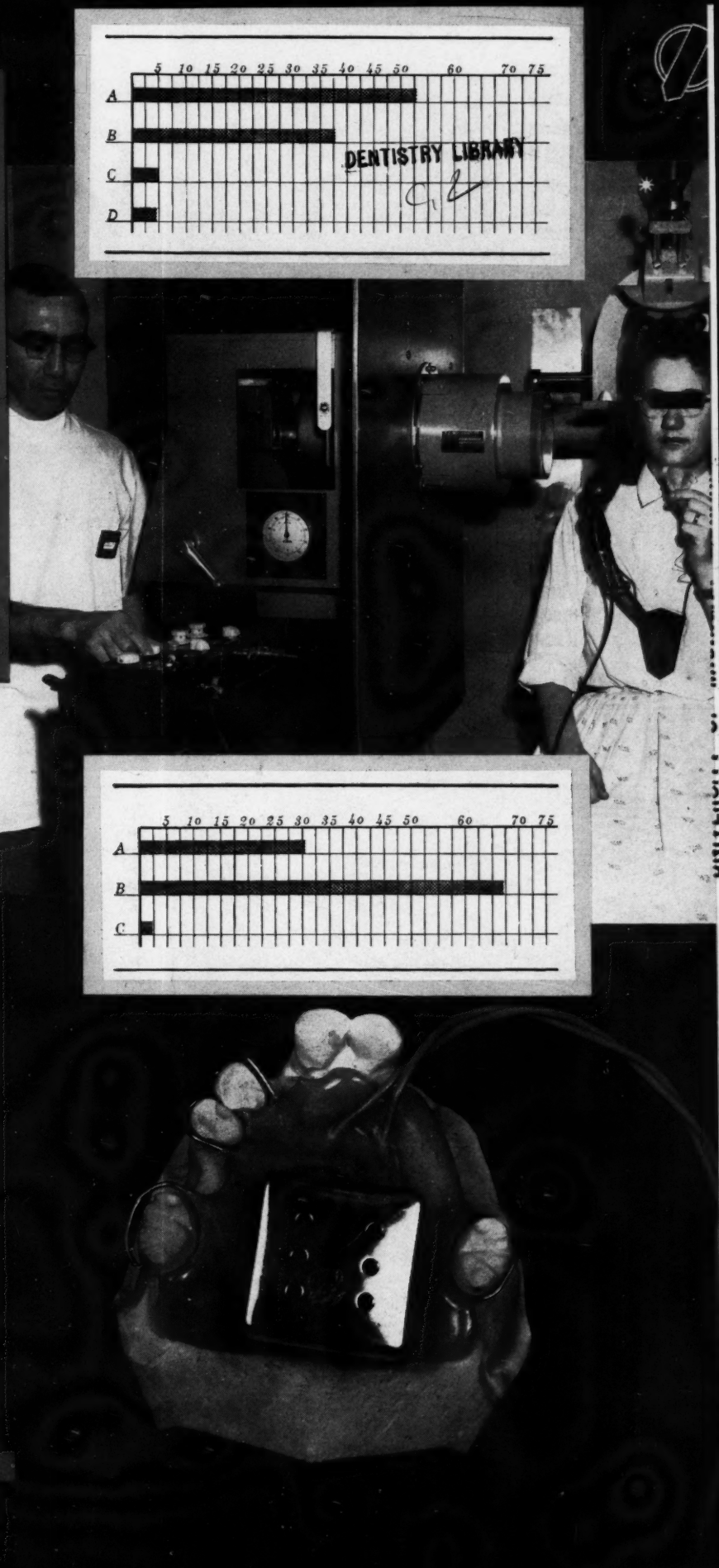

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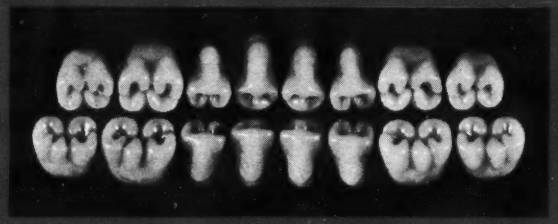

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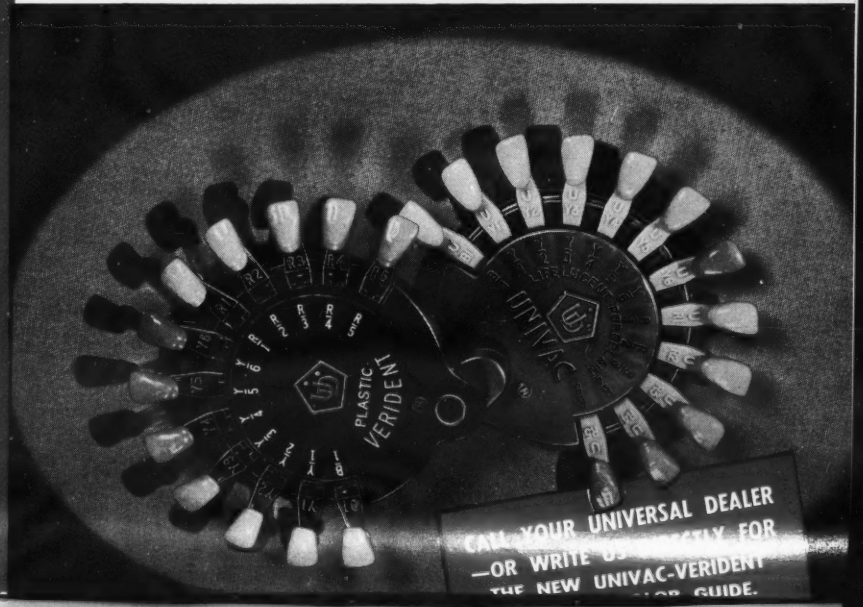

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EDLEY O. BRENNER, D.D.S. (University of Southern California, College of Dentistry, 1924) is a general practitioner who makes his first appearance in DIGEST this month with his article CONTACT POINT GAUGE AS APPLIED TO CAST RESTORATIONS. The photographs for Doctor Brenner's article were made by Karl Hok.

RAPHEL ESCOE, B.S. (City College of New York, 1948), D.D.S. (New York University College of Dentistry, 1953) is a general practitioner who published his first technical article in DIGEST in September 1956. This month Doctor Escoe presents another useful technique, IMMEDIATE DIRECT SPACE MAINTAINERS.

GLENN E. WILHELMY, D.D.S. (University of Kansas City, School of Dentistry, 1929) confines his practice to oral rehabilitation and will be remembered for his comprehensive evaluation of ultrasonics in operative dentistry which appeared in the March 1957 issue of DIGEST. This month Doctor Wilhelmy presents another article of special importance, CAVITY PREPARATION UNDER GENERAL ANESTHESIA IN A HOSPITAL.

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A Dental Approach to SPEECH RESTORATION *in the Laryngectomee: A Preliminary Report*

HERBERT K. COOPER, D.D.S., D.Sc.*, and ROBERT T. MILLARD, M.A., Lancaster, Pennsylvania

DIGEST

This article describes the chief problem of the laryngectomee, that of adjusting to the task of re-training the speech faculty. The generally used aids in this discipline are reported, in particular that of a new small audio emitter to be placed on a denture in the buccal area and connected to a battery carried in the patient's pocket. The mechanism is activated by a switch secured in the armpit of the patient.

Factors Inherent In Speech Loss

Speech is lost after surgery performed on the larynx for malignant disease. Although the vocal cords have been removed there remain the auxiliary organs of speech: the lips, the tongue, the teeth, the palate. If these organs can be utilized it is possible to make some restoration of speech. The method of utilization described in this article consists of the incorporation of an electric amplifying device in a dental appliance.**

Problem of Speech Restoration—Although the source of sound is removed in the laryngectomy procedure, the articulating complex of the oronasocavity remains (the lips, teeth, tongue, hard and soft palate). The problem is to place within the confines of the mouth-throat-pharnyx area a *source of sound* approximating as closely as possible that of the human voice. If this could be done successfully it was believed that a semblance of good speech could be produced.

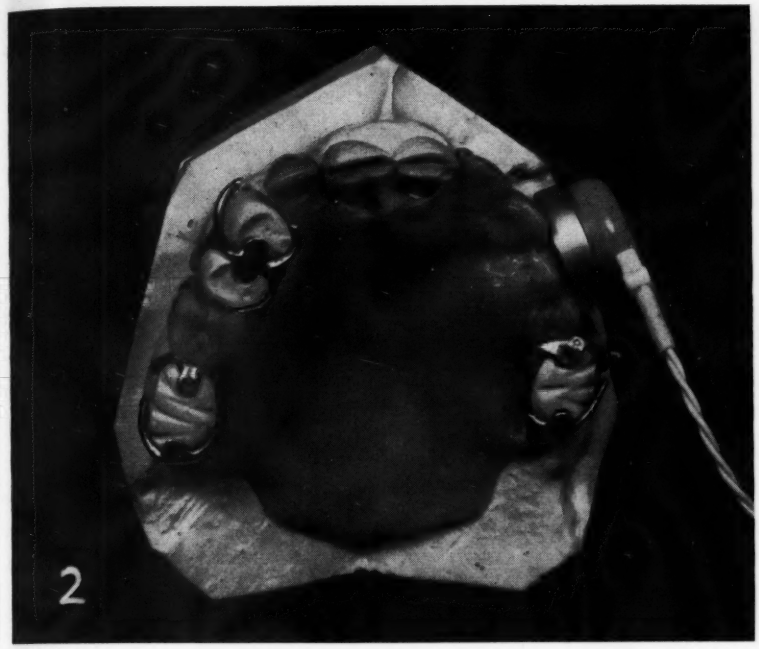
Multiple Approach to Problem—A combination of agencies within the Lancaster Cleft Palate Clinic[1] approached the problem simultaneously: (1) the prosthodontist with experience of bulb positioning in the throat; (2) the speech pathologist employing scientific instrumentation for speech measurements; (3) the research department with sound x-ray motion picture apparatus to evaluate the speech mechanism that remained

1.
Electrostatic speaker attached to dental prosthesis provided background "noise" for speech in initial experiment.

*Director of Lancaster Cleft Palate Clinic, Lancaster, Pennsylvania.

**Acknowledgement of cooperation in the preparation of the electronic amplifying device is gratefully extended to F. Allan Hofmann of the Lancaster Cleft Palate Clinic and to H. James Rand and Rudolph H. Tramwell of the Rand Development Company.

[1]Cooper, H. K.: Integration of Services in the Treatment of Cleft Lip and Cleft Palate, JADA **47**:27-32 (July) 1953.



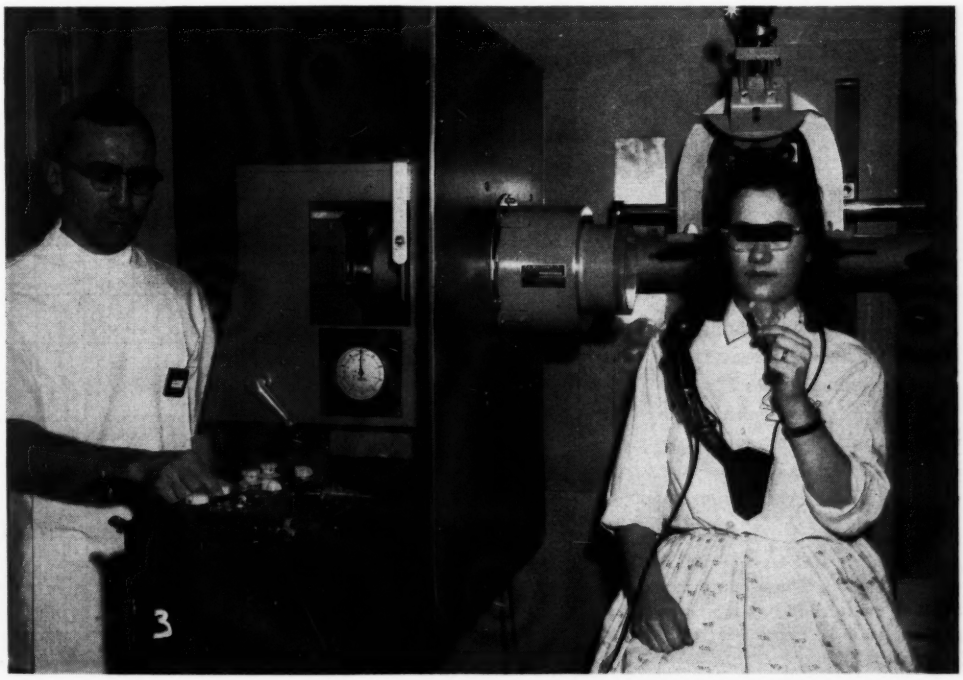
2.
Sound emitter attached to buccal surface of dental prosthesis. When the emitter is energized, sound is conveyed through a hollow channel to posterior area of the appliance.

after laryngectomy. In corroboration of this theory, a small speaker was secured and placed on a dental appliance (Fig. 1). It was demonstrated that speech sounds could be produced without much effort or practice.

Experimentation With Device

The sound-making apparatus is in reality a hearing aid in reverse. The essential difference is that more power is required to produce sound than to receive it or magnify it. From the studies undertaken so far, it is evident that articulation is improved when the sound is placed in the posterior part of the mouth or into the throat. That in reality is the normal place of origin of natural speech sounds.

Application of Sound—Based on previous experience in placing artificial vela in the throat, methods of applying the sound were studied. It was found that better speech sounds were possible when a small audio emitter was placed in the buccal area on a denture, or on any appliance of the Hawley or Kingsley type. The emitter must be introduced as an in-



3.
Cineradiographic unit with image intensifier employed to analyze the function of the speech mechanism within the oral and pharyngeal cavities.

4.
Sound spectrographic instrument provides a three-dimensional speech pattern on paper; frequency versus time, related to intensity. Comparative records chart patient's speech progress.

tegral part of a hollow denture which extends well into the soft palate (Fig. 2). We believe that in time quality and variability in the sounds produced can be developed.

Mechanism—A fine wire leads from the dental appliance that carries the sound-making mechanism to the battery that is carried in the pocket. The mechanism is activated by a switch secured in the armpit of the patient.

Operative Principles—1. The prosthesis is specifically designed to achieve the best results acoustically and esthetically without hindering mouth hygiene and can be removed during mastication.

2. It is important that the denture be constructed in an electronic prosthetic acoustical center.

3. Use of a prosthesis poses no problem, since the majority of the patients are in the age bracket where wearing a denture is commonplace.

4. It is imperative that the mouth and teeth be put in excellent hygienic condition before making the speech aid and that superior oral hygiene be maintained.

Postoperative Problems From Laryngectomy

In the Lancaster Cleft Palate Clinic it was imperative to establish a speech department because one of the major problems of the cleft palate person is to acquire socially acceptable speech. Moreover, since this clinic deals with all types of speech disorders, not only those of cleft palate, a laryngectomized subject frequently appears for help and advice. In observing these

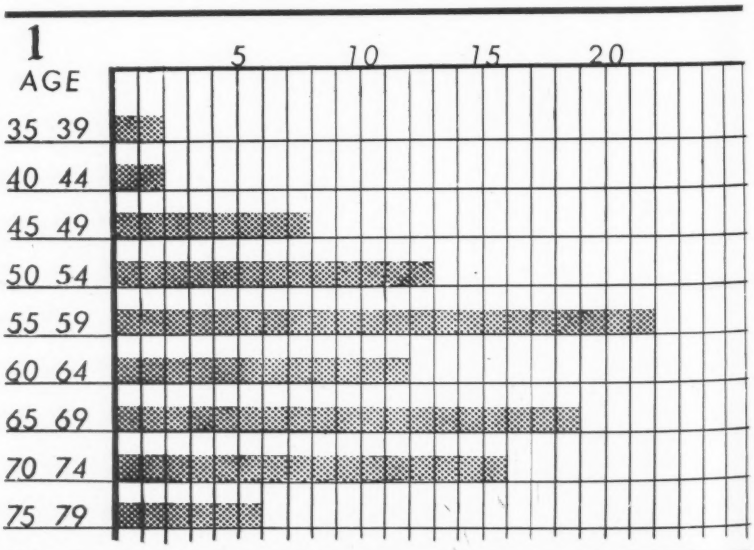


Chart 1.
Age range of 100 laryngectomized patients is shown. The median age range is 60-64 years. The youngest person reporting was 37 years old; the oldest, 78 years old.

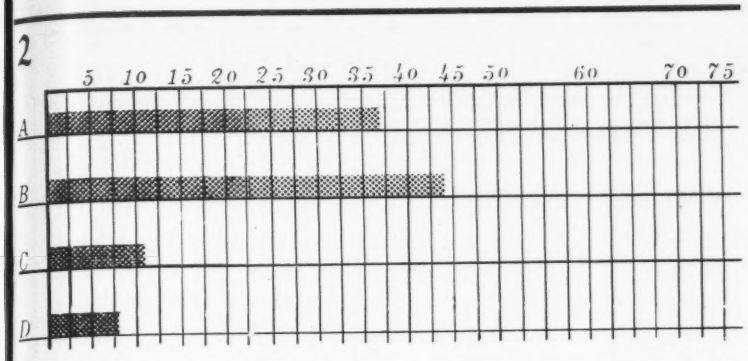


Chart 2.
Adequate information from surgeon regarding the patient's physical condition and a speech-training program: (Group A) Information concerning physical condition and information about speech-training program. (Group B) Information concerning physical condition but no reference about speech training program. (Group C) No information concerning physical condition or speech-training program. (Group D) Did not reply to this question on questionnaire.

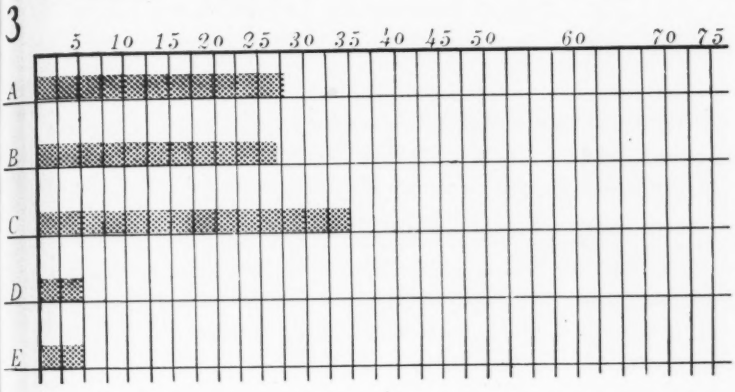


Chart 3.
Laryngectomees attempted to learn esophageal speech from (A) Speech therapists; (B) Another laryngectomee; (C) Self; (D) Physician; (E) Did not reply to question.

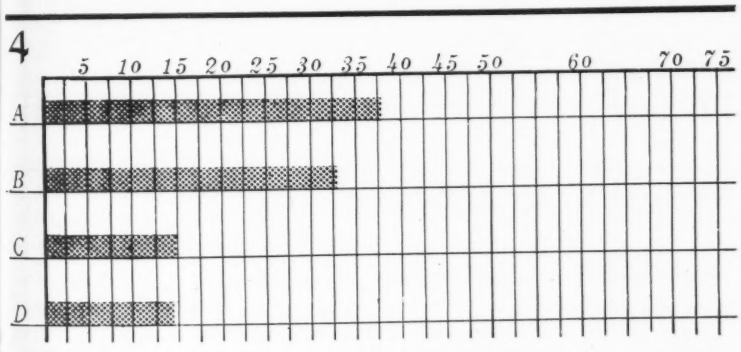


Chart 4.
Laryngectomees reporting on their difficulty to master esophageal speech: (A) Extreme difficulty in speaking; (B) Moderate difficulty in speaking; (C) Not at all difficult to speak; (D) Did not reply to this question on questionnaire.

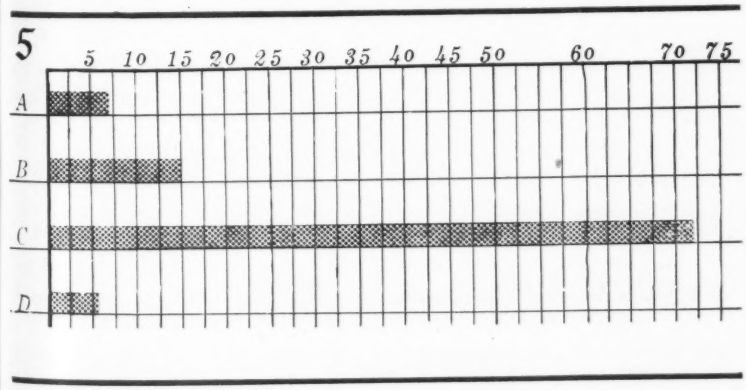


Chart 5.
One hundred laryngectomees report to the question: Are you pleased with your speech? (Group A) Yes, completely satisfied. (Group B) Yes, but wish to improve. (Group C) Reported poor speech or inability to talk. (Group D) Did not answer question.

Only 22 per cent of this group were satisfied with their speech. 72 per cent reported poor speech or inability to talk. The remaining 6 per cent probably are not satisfied with their speech or they would have answered the questionnaire.

postoperative patients, situations and conditions which closely parallel those of the postoperative cleft palate patient have been noted. Study of many case history questionnaires revealed that the people who had undergone laryngectomy were unprepared for the problems they would meet *after* the operation.

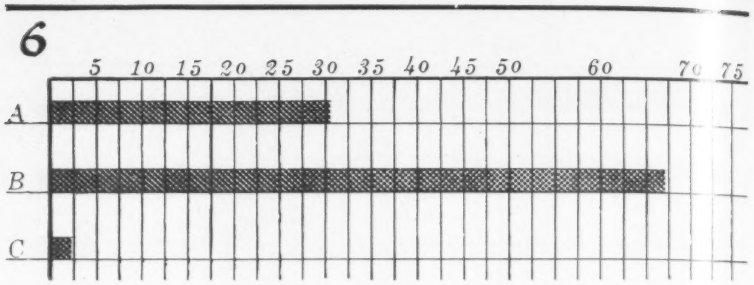


Chart 6.
Number of laryngectomees reporting the use of artificial speech aid. (A) Have used an artificial aid. (B) Have never used an artificial aid. (C) Did not reply to questionnaire.

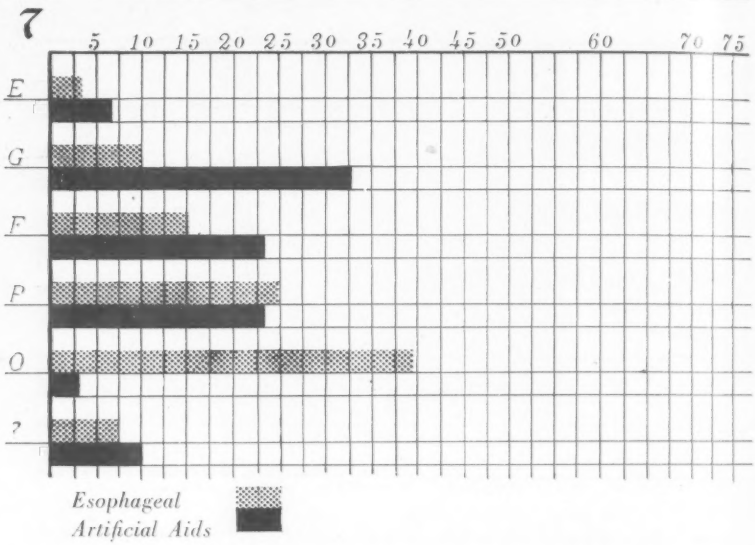


Chart 7.
Relationship of esophageal speakers and users of artificial speech aids regarding self-rating of speech. (E) Excellent. (G) Good. (F) Fair. (P) Poor. (O) No Speech. (?) Did not reply to questionnaire.

This chart was analyzed in percentage.

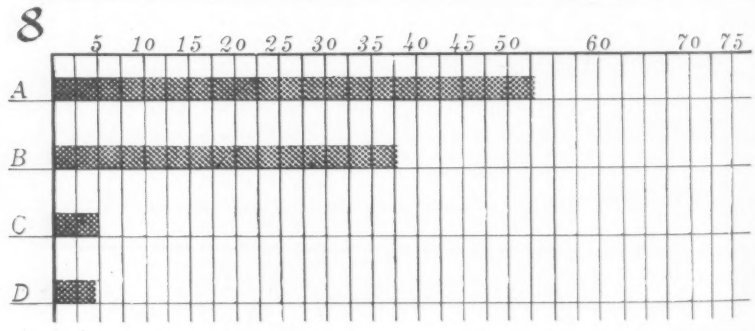


Chart 8.
Per cent of laryngectomees who could return to their former occupation. (Group A) Could return to the same position although somewhat modified. (Group B) Could not return to the same position. (Group C) Retired after laryngectomy. (Group D) Did not answer questionnaire.

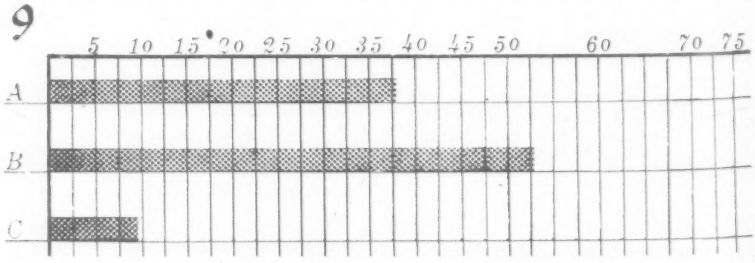


Chart 9.
Per cent of laryngectomees whose social life changed as a result of operation. (Group A) Yes, quite markedly. (Group B) No. (Group C) Did not answer questionnaire.

Psychologic Trauma Experienced—The condition that makes a laryngectomy necessary is so grave that in most cases it is difficult to look beyond the immediate need: removal of all cancerous tissue. The psychologic

What Is Speech?

"The terms 'speech' and 'language' are commonly used interchangeably, but 'speech retains more explicitly than language the fundamental suggestion of articulate or vocal utterance' (Webster). Again a further distinction is imperative. To vocalize is to make a noise with the vocal cords. Only *speech* is the event of codifying a thought in sets of controlled, connected sounds. As sound waves are blown out of the larynx, they are molded by a complex device into connected pulses that have meaning as speech. All air-breathing 'higher' animals have a larynx. Most of them make all sorts of sounds, but they cannot talk. Some people without a larynx can speak quite well. Crows and parrots talk without a sound-producing larynx. It must be insisted that the larynx is not 'the organ of speech.'

"Then the crux of the anatomic problem is not in the sound maker, the larynx, but in the sound modeler, which extends from the outer rim of the larynx to the lips. It is convenient to divide this device into central and peripheral parts. Everything in the output distal to the nerves is the peripheral part of the speechmaker. Everything proximal to it that serves its integrated action is the central part of the speechmaker. But in our studies of the brain we will stay far from the distractions of such higher controls as 'intellection.'

"The oral apparatus, freed wholly from prehension and largely from preparatory feeding, has become available for communication. This poses two questions. What anatomical evidence can be found in the central structures to correlate with the shift in function from prehension to speech?"

From Evolution of the Speech Apparatus by E. Lloyd DuBrul, Springfield, Illinois, Charles C Thomas • Publisher, 1958.

trauma involved is severe and is similar to the emotional trauma to a mother at birth of a cleft palate baby. In 100 laryngectomy cases 68 indicated that they were completely unaware of the course their recovery was to take. They had never entirely understood what they were facing: their total silence, the changed way of breathing, the danger in swimming, and radical changes in other life situations.

Observations From Cases Reported—1. The median age level of the 100 cases surveyed in this report was 62 years. These six women and 94 men were from 30 states and ten foreign countries.

2. The most frequent preoperative symptom reported was hoarseness (74 per cent).

3. Half of the operations to remove the cancerous tissue took place within two weeks after diagnosis.

4. Only 32 persons considered that they had received full information about their physical condition and information about the subsequent necessity for re-training of the speech faculty.

5. Speech instruction was received by 55 persons from another laryngectomee or from a speech therapist.

6. One third attempted to learn speech on their own. Thirty-five of this group used an artificial aid at some time. Twenty-three have continued to use such a device for communication.

7. Slightly less than 50 per cent could not return to their former occupation. The same percentage said their social life had changed drastically. Rehabilitation became more difficult because of this.

Various Methods Preferred—Opinion is divided as to the relative value of the various methods of communication employed. This will no doubt always be true as some patients manage quite well with the present mechanical or electronic aids while others are proficient in the use of esophageal speech. Two-thirds of the number in the group, however, applied for help when none of the commonly used methods proved satisfactory for them. In this group the problem is in many instances psychologic; for improvement the total person must be treated.

Artificial Aids And Methods of Use

For many years we have been making at the Lancaster Clinic obturators, or speech bulbs, for people whose soft palate is either missing or short. We have used this experience in planning the dental appliance that is employed in speech restoration after laryngectomy. It is possible that the same type of appliance may be helpful in other conditions where speech has been affected.

Cineradiographic Unit and Spectrograph—A grant from the Gustavus and Louis Pfeiffer Research Foundation made it possible to purchase a cineradiographic unit with image intensification (Fig. 3) and a sound spectrograph (Fig. 4), which are important aids in diagnosis and treatment planning in cleft palate and other speech therapy cases.[2,3] These diagnostic tools and accompanying methods are now employed in investigating the speech problems of the laryngectomee. The x-ray motion picture unit records the dynamics of speech function using sound-on-film technique. The sound spectrograph records speech sounds in graph form.

Relative Merits Compared— In a recent article Hyman[4] states, "The results of the study indicate that acoustically, speech production by means of the artificial larynx was preferred over esophageal speech." This can be a debatable subject, similar to the relative merits of an artificial velum or obturator to a surgical procedure in

---

[2]Hyman, Melvin: An Experimental Study of Artificial Larynx and Esophageal Speech, J. Speech and Hearing Disorders **20**:291-300 (Sept.) 1955.

[3]Cooper, H. K.: Cinefluorography with Image Intensification as an Aid in Treatment Planning in Cleft Lip and/or Cleft Palate Cases, Am. J. Ortho. **42**:815-826 (Nov.) 1956.

[4]Berry, Harrison M., and Hofmann, F. Allan: Cinefluorography With Image Intensification for Observing Temporomandibular Joint Movements, JADA **53**:517-527 (Nov.) 1956.

cleft palate treatment. Our experience indicates that each method has a right and a wrong time of use.

Added Advantage—Hyman also suggested motion picture analysis for further testing of the speech produced by the esophagus. We have found in addition to this procedure, that x-ray-motion pictures with sound, offer the added advantage of being able to study the dynamics of the remaining speech mechanism. This x-ray-motion picture analysis is correlated against the sound spectrographic pattern, which is a visible speech record, similar in value to the electrocardiograph.

Report of Some Results

Since we have been dealing with speech by artificial methods, and have had experience in the construction of appliances to be placed into the throat, it seems expedient to apply this approach to the problems of these patients in the following areas:

1. The artificial larynx users report that the device is not versatile enough. One of these appliances uses only the lips and anterior part of the tongue. This eliminates the forming of speechsounds made by the back of the tongue and the soft palate, g, k, ng. Effects of cold weather and mucus reduce efficiency of the reed-type aid.

2. Background noise made by other instruments seemed to interfere with their use in some circumstances or situations, such as in groups or when using the telephone.

3. Some esophageal speakers complained of exhaustion after such speaking. Forty-one per cent of the group reported pain in the stomach and intestines, producing extreme discomfort at times. More than half reported the impossibility to get enough volume or reported difficulty in talking.

4. Other reasons for not using esophageal technique: radical neck surgery, fistula in neck, partial paresis, extensive radiation therapy, continuous coughing, extreme nervousness, and ulcers.

In our opinion, esophageal speech or artificial aids can be satisfactory to some persons. With the express purpose of helping those who could not use any of the various methods now known, we started to explore the possibility of using a dental appliance to retain the amplifying electronic mechanism.

Summary and Conclusions

1. Another method of producing artificial speech for the laryngectomee has been introduced. An electronic speech aid has been described in which the sound source of speech of the laryngectomized patient is emitted within the oronasocavity.

2. By the use of a dental appliance a satisfactory method of introducing a speech sound-carrying mechanism into the area from which the sounds came originally is made possible.

3. Information has been reported from 100 case histories sent to the clinic by laryngectomees from 30 states and 10 foreign countries. The survey reveals that some information about a definite rehabilitation program is needed for the patient.

4. Because two-thirds of the laryngectomies state that they are not satisfied with their present speech habits, or do not talk, an improved artificial speech aid is desired.

2426 *North Lime Street*

The Mechanism of Speech

"The crucial behavioral difference singularizing man from even his closest relatives, is the special group integrating mechanism of speech. The speech habit may introduce one of those circuits that run in reentrant paths to the brain, acting as a corrective feedback from an environment of individuals, to modify the behavior (and structure) of both the individual and the group as an entity.

"The physical event of speech is a pulse of discrete, vibrating, jointed segments of air. These segments are shaped by anatomical parts. The parts are the palpable periphery of a continuum of structure and event whose proximal parts fan out through the depth of the brain. Speech is first a morphologic problem. Morphology is a historic problem. Speech has usually been studied as if it could be settled by itself, but a soaring take-off can only be gained along the runway of phylogenesis."

From *Evolution of the Speech Apparatus* by E. Lloyd DuBrul, Springfield, Illinois, Charles C Thomas • Publisher, 1958.

CONTACT POINT GAUGE

As Applied to Cast Restorations

EDLEY O. BRENNER, D.D.S.,
Los Angeles

DIGEST

The cast gold inlay has become one of the most widely used remedies for the restoration of carious teeth. The effort has continued to improve accuracy in fit and anatomic form, and to restore, as nearly as possible, function and oral health. The importance of accurate cavity preparation, the wax pattern, and method of casting the gold restoration has been emphasized and these procedures have been perfected. This article discusses the factor of pressures against adjacent teeth and presents a step-by-step method for the use of a dental contact point gauge which is extremely useful in recording movements of teeth and determining pressures at contact points.

Restoration of Pressures Necessary

Failure of the cast gold restoration sometimes occurs because the operator has neglected to restore the proper pressures against adjacent teeth in which methods of "cut-and-try" have been exercised unsuccessfully. That teeth are movable is common knowledge. When seating a restoration the amount of stress the adjacent teeth should tolerate *should* be known, and how much they can accommodate without interfering with occlusal relationship.

Correct Pressure Important—Damage may be caused by two little or two great contact. Too little contact causes a free field of invasion of the periodontium by bacteria and food impaction resulting in the loss of bone structure. To avoid destruction of surrounding soft tissue and bone from incorrect pressure, the contact point must be at the *correct position of the tooth,* without too little or two great pressure between the restoration and the adjacent teeth.

Method to Ascertain Proper Contact Pressure—Many procedures to determine the contact pressure and the proper positioning of contact points have been used. In some methods wax is added to the wax pattern before investing and casting, and in others gold solder is added to the cast restoration which is adjusted by grinding.

Correct Adjustment—Contact points should be tight enough to prevent food impaction but not so tight as to be uncomfortable. 1/1000 inch has proved to be satisfactory in all single contacts.

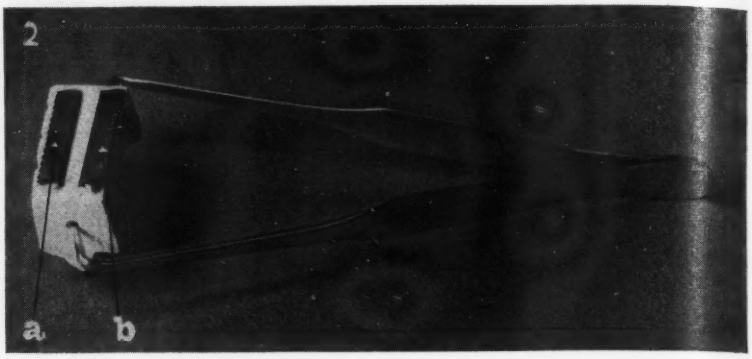
Device for Accurate Measurements—An available device is a gauge which records accurate measurements and removes the guesswork from this important measure in restorative dentistry. The following technique may be adopted in the use of the contact point gauge.

Technique for Use of Gauge

Step 1—The impression of the teeth prepared for the restoration should

1.
The method of forming the wax pattern with an overextended contact point is shown.

2.
The separated dies being held in position with tweezers while the saw blades (A and B) are attached to the base. Also shown is the position of the locating points.



be poured extremely high. When separated from the impression the die should be about 1 inch from the occlusal surface of the teeth to the base of the die.

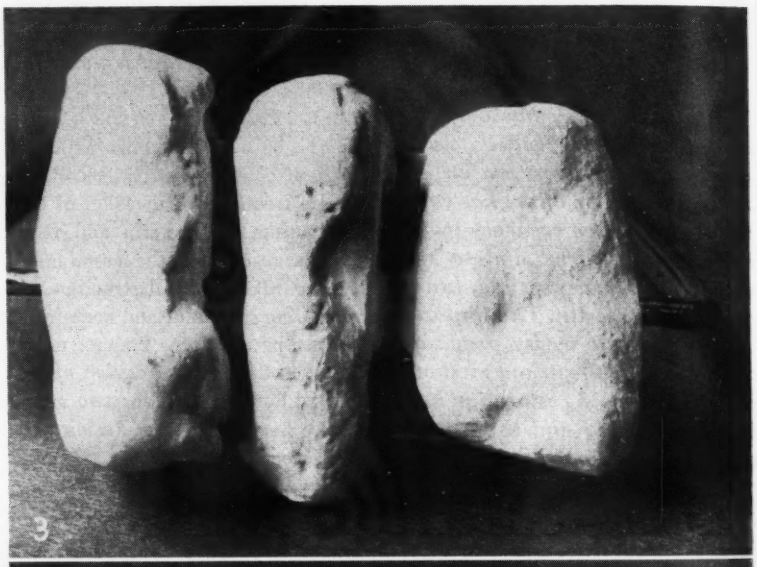
Step 2—Using a model trimmer, the die is squared off at each end and the base ground flat. At this point the die will be about ¾ inch high and will work well in the gauge.

Step 3—(a) Score the die on the buccal and lingual surfaces with a Joe Dandy disc. These cuts should be wide and deep so that the dies will break easier and the crack will be visible.

(b) The wax pattern is made with an overextended contact point. An easy way to do this is to force a warm wax pattern against the adjacent tooth or cold opposing wax pattern. This will leave a dimple in the contact area. Before investing the pattern, fill the dimple with a drop of wax (Fig. 1).

Step 4—The segments of the separated dies are held in position by the large pair of tweezers shown in Figure 2. Two pieces of spring steel (cut small hack-saw blades length of die) are placed on the base of the die (Fig. 2, A and B). These are sealed with sticky wax. The sticky wax will hold the metal in place while the stone or plaster is applied over the blades leaving the interproximal spaces clear. If the segments of the die are large enough it is easy to apply the plaster or stone to each individual segment (Fig. 3). If they are small and there are more than three the stone can be put over the whole base; after it has set, it is easy to cut through with a Joe Dandy disc (Fig. 4).

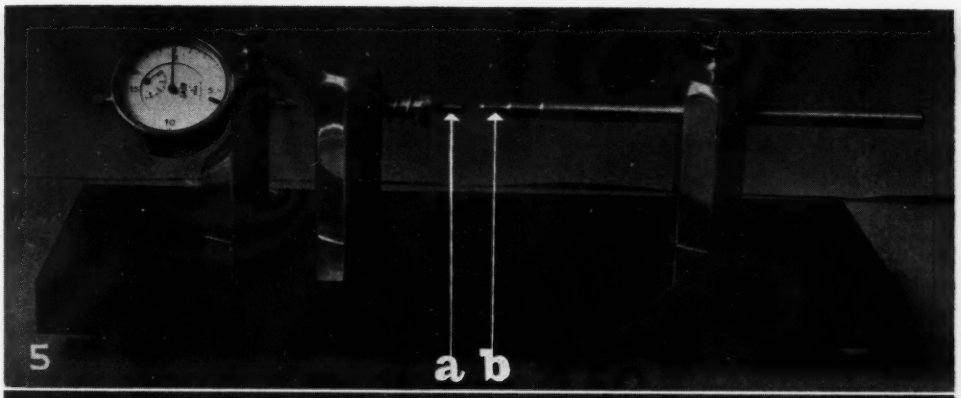
Step 5—Locating points are placed in the approximate center of each end of the die (Fig. 4, A and B). The locating points are made with a No. 9 bur. The diameter of the headpin and tailpin (Fig. 5, A and B) is just a little larger than the hole made by the No. 9 bur. This keeps the headpin



3.
Hack saw blades are shown attached to each individual segment of the die with stone.

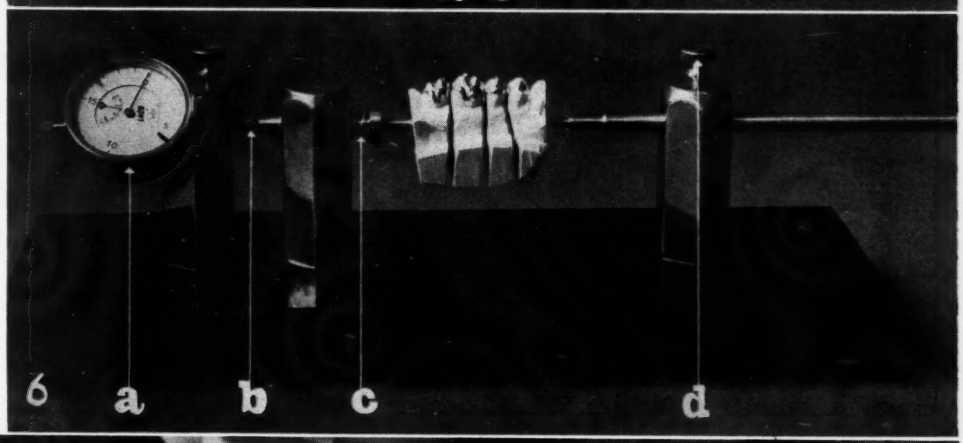
4.
Illustrates the technique of attaching the saw blade to the die when the segments are small.

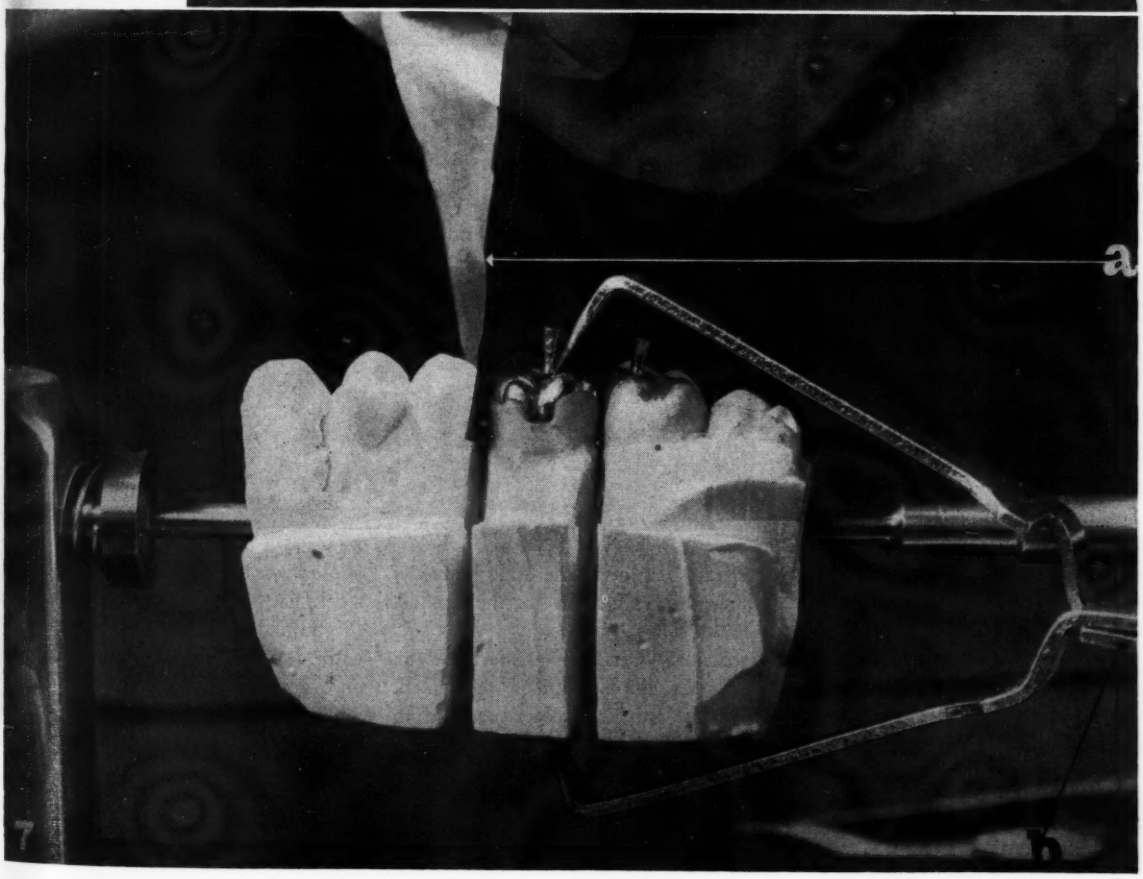
5.
(A) Headpin.
(B) Tailpin.



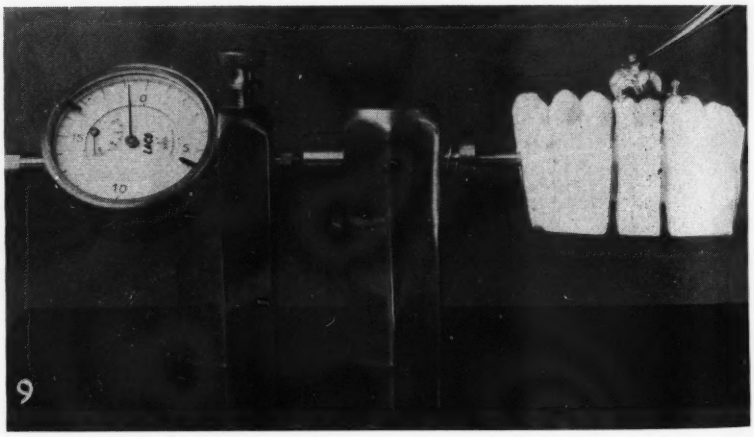
6.
(A) Dial Indicator. (B) Dial Indicator point. (C) Spring. (D) Tailpin locking screw.

7.
Illustrates the shim stock between the contact points for calibration of the gauge to the contact points and the tweezers holding the restoration in position.





8.
Illustrates Bard-Parker blade holding open contact, not being adjusted.



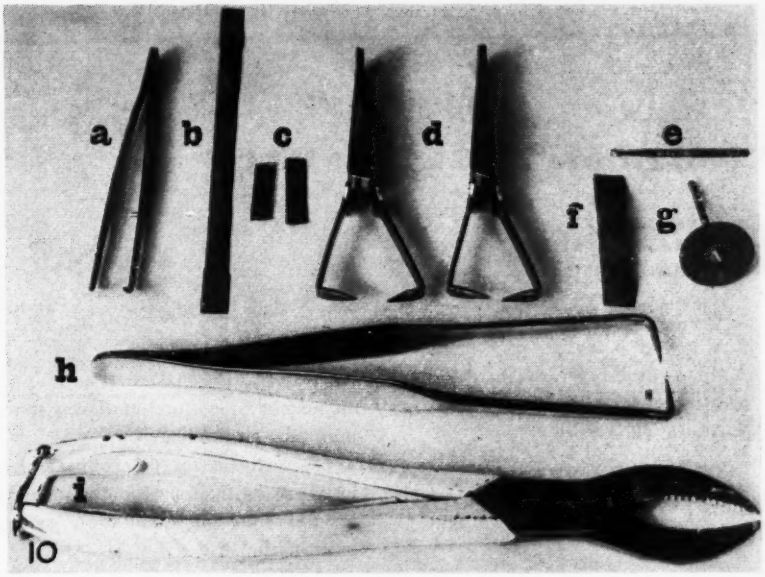
9.
Illustrates removing restoration to determine the measurement of the contact point.

and tailpin from wobbling or changing positions in the locating points.

Step 6—The dies are placed in the gauge by holding one locating point on the headpin and sliding the tailpin into the other. Apply enough pressure on the tailpin to depress the spring (Fig. 6C) in the headpin. The headpin extension will then contact the Dial Indicator point (Fig. 6B). When the pointer on the Dial Indicator is deflected, tighten the tailpin locking screw (Fig. 6D). Any separation in the parts of the broken die will be measured by the Dial Indicator (Fig. 6A). Because the measurement is not through the center of the contact points, the dial gauge will not give a correct reading. The dial gauge is therefore calibrated to the contact points.

Step 7—Place the restoration on the die, making sure it is well seated. A small pair of tweezers is used to hold the restoration in place. This is done by clamping it from the base of the die to the occlusal surface of the restoration (Fig. 7B). Separate the die at one of the contact points and slip a piece of 1/1000 of an inch shim stock between them (Fig. 7A). Set the adjustable dial of the Dial Indicator at zero. Pull the shim stock out and the pointer of the Dial Indicator will show exactly where 1/1000 of an inch is on the dial. This step calibrates the gauge to the contact point. It is necessary to calibrate the gauge to each contact point before adjusting it.

10.
Armamentarium required.



Step 8—The restoration shown in Figure 8 has two contact points but only one can be adjusted at a time. The contact point not being adjusted therefore must be held out of contact. A thin knife blade (Bard-Parker) wedge between the broken parts of the die will hold the contact point open (Fig. 8).

Step 9—Remove the tweezers that hold the restoration in place. Set the gauge at zero and remove the restoration (Fig. 9). The Dial Indicator will measure the amount the contact point is overextended. Remove small amounts of the contact points until adjusted to 1/1000 of an inch. 1/1000 of an inch will create the proper pressure for a single contact point.

Factors in Use of Gauge

Contact Points Build Up—If 1/1000 of an inch is left on each side of a MOD the result would be a total of 2/1000 of an inch which would be too tight. Leave 1/1000 of an inch for a single DO or MO and *three quarters* of 1/1000 of an inch on each side of a MOD.

Adjusting Multiple Inlays—Where there are three or more contact points involved use one-half of 1/1000 of an inch at each contact point. These are suggested measurements and have been satisfactory in practice.

Armamentarium Required

1. Cotton pliers
2. Ribbon saw used to separate below gingival margin
3. Spring steel (small hacksaw blades)
4. Small tweezers
5. No. 9 bur
6. 1/1000 shim stock
7. Joe Dandy discs
8. Large tweezers
9. Plaster shears

Summary

Note that after the cavities are prepared, the impressions are taken, and the dies are run in stone, the restoration is as accurate as it will ever be. In this procedure adjustments are made on the dies on the machine, not in the mouth. After placing the temporary restoration material in the prepared cavities it must be remembered that all temporary materials act as separators. Thus, the restoration will not be as tight in some cases as it will be in a day or two.

This instrument has been used for two years and the pressure has never varied even in periodontal cases. It has been demonstrated that an MOD cannot be adjusted with equal mesial and distal pressures without the use of the gauge.

The value of this instrument lies in the fact that hours of chair time have been saved and embarrassing explanations for adjusting contact points in the mouth have been eliminated.

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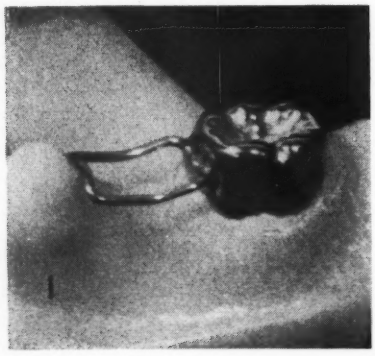
Immediate DIRECT SPACE *Maintainers*

RAPHAEL ESCOE, B.S., D.D.S.,
Massena, New York

DIGEST

This article presents the rationale and a technique for the construction of immediate direct space maintainers. In the step-by-step procedure described the offending tooth is removed and the space maintainer is made and inserted in one visit.



1.
Typodent showing space maintainer.

Indications and Requirements

In the Deciduous Dentition—(1) When a deciduous cuspid, first molar, or second molar is removed (singly, or in any permutation or combination) more than six months prior to the normal time of exfoliation, a space maintainer is indicated.

(2) Criteria for determining that loss is more than six months prior to normal time of exfoliation (x-ray examination):

a) The succeeding tooth is still covered by layer of bone.

b) Less than one half the root of the succeeding tooth is formed.

(3) Sufficient teeth of good prognosis, as abutments, must be present. In Table 2 are outlined combinations of missing teeth that may be treated with this technique.

(4) The patient must be sufficiently mature, trained, and educated for extraction using local anesthesia and a chair procedure of about one hour.

In the Permanent Dentition—The procedure is particularly indicated in adolescents where a permanent tooth is lost and the patient is too young for a fixed bridge.

2.
A space maintainer is to be made for the second deciduous molar. This picture shows a stainless steel crown fitted on the first deciduous molar.

Function of the Space Maintainer

A space maintainer prevents malocclusion due to premature loss of teeth. Premature loss of deciduous teeth is an important cause of malocclusion. The cause is chiefly mesial drift of teeth posterior to the lost tooth.

Possible Malposition — When the permanent tooth, in its turn, erupts to replace the prematurely lost deciduous tooth it may find its space missing or diminished. As a result it may be impacted or malposed.

Shifting Prevented—A space maintainer functions to prevent contiguous teeth from shifting into the space previously occupied by the prematurely lost deciduous tooth.

Pathologic Conditions Avoided — The effects of premature loss and nonreplacement of permanent teeth on occlusion are too well known to require review.

Parts of the Immediate Direct Space Maintainer

1. A means of attachment to the abutment teeth:
   a) Pinch band (orthodontic band)
   b) Stainless steel shell crown
2. A mechanical device to prevent shifting of the teeth, soldered to the attachment (Tables 1 and 2):
   a) Loop
   b) Arch-wire

Typical Procedure

1. Administer local anesthetic.
2. Prepare abutment:

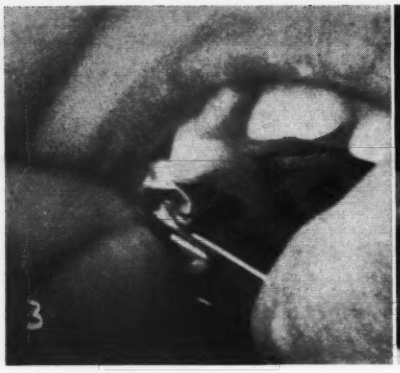
a) If a stainless steel shell crown is the attachment (1) reduce occlusal and any pronounced bulges with stones, and (2) excavate caries but do

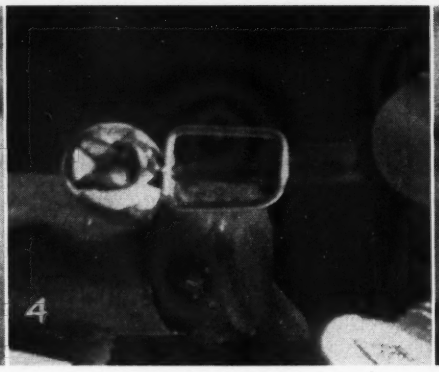
TABLE 1 **Selection of the Attachment**

Type of attachment	Retention	Radio-lucent	Precious metal	Prepara-tion of abutment	Chair time	Lab time, lab fee	Does it restore the abutment	Notes
Stainless steel shell crown	Excellent	Slightly	None	Slight	less than 15 minutes	None	Yes	Attachment of choice with deciduous abutment
Pinch Band (orthodontic band)	Good	Slightly	None	None	less than 20 minutes	None	No	Attachment of choice with permanent abutment

TABLE 2 **Indications and Design**

Teeth lost in quandrant (Indications)	Retention	Loop or arch-wire	Notes
Deciduous cuspid	Crown on first deciduous molar	Loop engages distal of lateral	May need adjustment or replacement if placed before permanent lateral has erupted (7-8 years)
Deciduous first molar	Crown either cuspid or second deciduous molar	Loop engages either distal of cuspid or mesial of second deciduous molar	The choice of which tooth to crown depends on which abutment is in greater need of restoration
First and second deciduous molar (first permanent molar is erupted)	Pinch band on first permanent molar	Loop engages distal of deciduous cuspid	If there are missing teeth on the contra-lateral side, both permanent first molars are banded and connected by lingual arch wire
Second deciduous molar (first permanent molar is erupted)	Crown first deciduous molar	Loop engages mesial of first permanent molar	
Second deciduous molar (first permanent molar not yet erupted)	Crown first deciduous molar	Loop enters the socket of the distal root of second deciduous molar and engages mesial of the unerupted first permanent molar	Check location of loop with respect to the unerupted first permanent molar, using x-ray
Multiple bilateral tooth loss with both six year molars erupted	Pinch band on each permanent first molar	Lingual arch wire	Arch wire must be passive
Cuspid and second deciduous molar lost	Crown first deciduous molar	Two loops attached to one crown	
Permanent teeth in succedaneous arch (mouth of adolescent)	Pinch bands	Loop	Design similar to fixed bridge. Ideal in adolescent who has lost permanent teeth and is too young for a fixed bridge





not restore cavities. The cement used to fix the appliance will fill these voids.

b) If a band is the attachment, clean the abutment, remove any caries which may be present, and restore the tooth in accepted manner.

3. Make crown or bands and archwire or loop.

4. Remove the diseased tooth.

5. Assemble the space maintainer by soldering together the components.

6. Check and perfect the fit of the appliance.

7. Isolate, dry, and cement.

8. Arrange for recall.

Step-By-Step Technique

Stainless Steel Shell Crown—For this procedure complete the following steps:

a) Select the stock crown which most nearly fits the abutment.

b) Contour crown to gingival outline using scissors and stones.

c) Shape crown with pliers: 1) Use Rocky Mountain K 129 plier to balloon the crown slightly, thus better fitting it to the contour of the tooth. 2) Rocky Mountain pliers K112 and K114 are used to crimp in the margin smoothly and uniformly.

d) This type of crown seems to have a margin which adapts itself to the tooth when the crown is forced into place (biting pressure). The crown clicks over undercuts, thus enhancing retention.

Pinch Band—The following steps are taken:

a) Form a loop of .005 stainless steel band material by spot welding the ends of strip together.

b) Adapt to the abutment tooth using a band-forming plier (Rocky Mountain 155B).

c) Fold over the excess and spot weld where the excess crosses the band. Cut off the excess which extends beyond the band.

d) Secure fine adaptation of the band to the abutment by using a band-pushing instrument and a gold foil automatic mallet fitted with a porte-polisher point.

e) If the band stands away from the tooth any place, pinch the excess with a plier and fold over. Spot weld the folded-over area. The band should be out of occlusion.

f) Finish, using stones and rubber abrasive wheels.

Loop—For this operation the following steps are taken:

a) Use .030 stainless steel wire. Shape with optician's pliers.

b) The loop is below the level of occlusion. It is not wide enough to irritate the tongue or check, but it is sufficiently wide not to interefere with initiation of eruption of the succedaneous tooth.

3.
With the second deciduous molar still in place a loop is prepared.

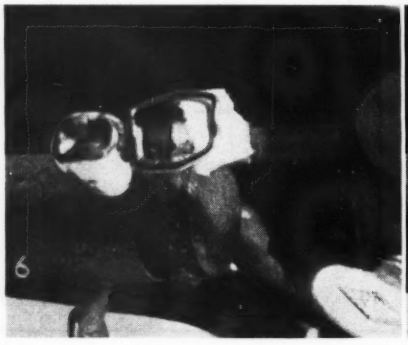
4.
The loop is spot welded to the crown.

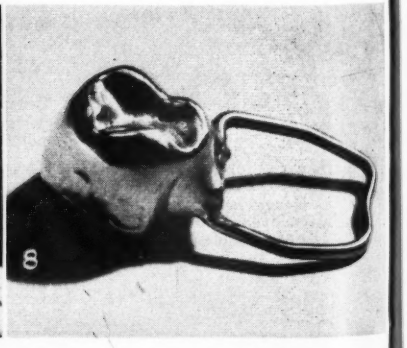
5.
The tooth is extracted and the loop brought to proper shape with the crown in place.

6.
The parts are electric soldered together. Note small slip of paper between loop and electrode to prevent short circuit of current through the loop.

7.
The solder joint completed. Note the flow of the solder.

8.
The completed space maintainer.





Arch Wire—Placement of the arch wire is important:

a) Use .030 stainless steel wire which is easy to shape with the fingers.

b) The arch wire must be passive. It must be so shaped that when it is placed there is no resultant force on the teeth. If this is not done soreness, looseness, and undesired movement of the teeth may occur.

c) The arch wire is soldered to the lingual of the bands and extends around the dental arch at the gingivolingual of the teeth.

Assembly—An electric welding machine should be used for this procedure. An alternate method is free hand soldering, but it is felt that this demands too much skill and training to be practical in the hands of the average practitioner, also soldering with a flame tarnishes the appliance and time must be spent polishing.

9.
The appliance cemented in place.

a) The parts of the appliance should first be spot welded together. This makes them easy to hold in proper position for soldering. At this point the fit of the appliance may be checked and corrected. Components are then fluxed and soldered using a freshly cleaned carbon. There should be a real flow of solder.

b) After soldering the appliance should be checked in the mouth and the fit perfected.

Cementation—The appliance is cemented into place exactly the same way as a crown, bridge, or inlay with this important exception: extreme caution must be exercised that the blast of air used to dry the abutments not be directed into a fresh wound. If a blast of air is directed into a fresh wound a subcutaneous emphysema may result.

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(*See pages* 128 *and* 129)

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Cavity Preparation

Under GENERAL ANESTHESIA *in a Hospital*

GLENN E. WILHELMY, D.D.S.,
Tucson, Arizona

DIGEST

Although most operative dentistry will always be done in the dental office there are occasions when it is advisable that these procedures be done in the hospital under general anesthesia. The two most common situations in which operative dentistry in the hospital is indicated are (1) in the case of persons who prefer such operations to be performed at one time without the inconvenience of frequent dental appointments, and (2) for those persons who have such a high degree of anxiety and apprehension that they neglect to receive routine dental care while in the conscious state.

This article is a pictorial presentation of a case in which 18 teeth were prepared for restoration while the patient was under general anesthesia for two hours and seven minutes.

Important Developments In Dental Armamentarium

In the past five years many changes have occurred in the armamentarium of operative dentistry. Many new types of cavity preparation instruments have been tried and discarded. Advances have been made in all types of rotary instruments. High-speed belt-driven and ball-bearing handpieces, as well as air turbines, ultrasonic instruments, and water-driven turbines have been used.

Two Valuable Instruments—The two instruments which the author of this article has found most effective are the ultrasonic and the *portable* water turbine.

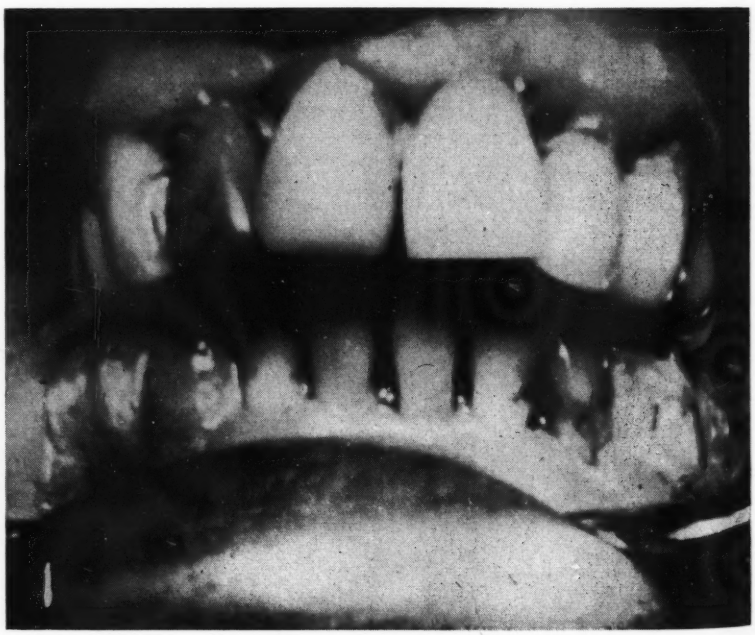
The Portable Water Turbine—It is this instrument that makes cavity preparation under general anesthesia possible because with this instrument the operator can do just as efficient a cavity preparation in a hospital surgery as he could do in his own office.

Simplicity of Use—Formerly, when it was required that a dentist do cavity preparation away from his office it was necessary to improvise some type of emergency equipment which was always unsatisfactory. With the introduction of the water turbine it became a simple matter to place the instrument on the back seat of the car, take it to the hospital, fill the water tank, and plug in the electricity. This is all that is needed with this type of equipment.

General Anesthesia Expedient

In routine completion of full mouth rehabilitation it has been found expedient, from the point of view of both comfort and time, to use general anesthesia for multiple cavity preparation. A combination of intravenous and inhalation anesthesia is applied. Two types of patients are particularly well pleased with this arrangement:

(A) The businessman who is unwilling to take from his office schedule the time required for extensive dental restorations. By this procedure he can



Author's Note: All the photography is by Ricardo F. Lopez, medical photographer, Department of Laboratory Medicine, St. Mary's Hospital, Tucson, Arizona.

take one day from his business during which all the preparations that are necessary for a full mouth rehabilitation are completed.

(B) In the second group are the "dental cowards" who are so sensitive to pain that they have allowed their teeth to deteriorate to a point where full mouth rehabilitation or full mouth extractions become necessary.

Pictorial Record of Case

The following illustrations provide a complete visual record of the preparation of 18 teeth consisting of crown, onlay, and finished preparations. A procedure of this extent would take several months if done in separate appointments in the dental office. The 18 teeth in this case were completed in two hours and seven minutes, under sodium pentothal® and nitrous oxide-oxygen anesthesia.

Figure 1, *Description*—A preoperative view of the patient's mouth: 18 teeth had been restored with various gold, silver, and silicate materials. With the amount of preparation required in an acutely apprehensive patient, a general anesthetic was believed to be the easiest method in this case for both patient and operator. To date 15 cases of this type have been concluded. This description was dictated during continuation of the procedure, employing a neck microphone and a tape recorder.

Procedure Recorded—The technique is presented here exactly as it was recorded in the operating room at St. Mary's Hospital in Tucson, Arizona. No detailed techniques for tooth preparation are described as standard techniques in common use were employed.

Figure 2—A view of the instrument bracket. Few hand instruments are necessary for this type of procedure.

Figure 3—With the patient in a prone position a standard mouth prop is inserted and the throat is packed to prevent aspiration of debris. A 4 by 4-inch vaseline® gauze tied with a length of dental floss is used. The anesthetist is shown injecting sodium pentothal into the tube which has already been introduced into the vein in the patient's arm.

Figure 4—The operator and his assistant removing crowns and bridges and preparing uncovered teeth in the upper arch. Note that direct vision is used and the operator looks directly at the upper arch. With the patient in a prone position it is much simpler to proceed by direct vision than it is to attempt to use a mirror.

Figure 5—A ¼-inch Safeside diamond wheel is being used to remove the enamel from the upper right cuspid. Note that a stream of water coming from the handpiece is directed on the diamond wheel as it cuts.

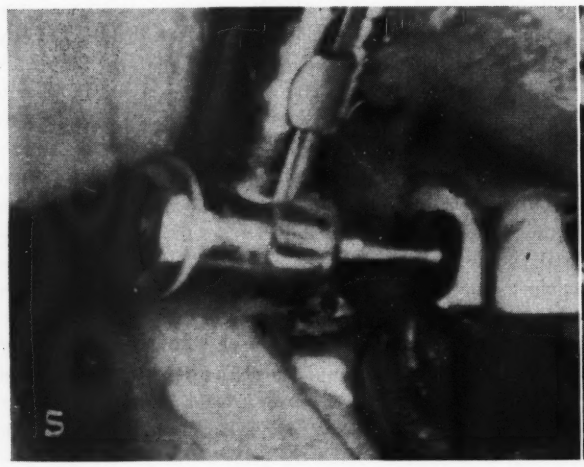
Figure 6—A ¾-inch Safeside diamond wheel is used to split the gold and veneer crowns holding the bridge on the upper left. The crowns are split from the gingival to the occlusal and then the cut is opened with a No. 48

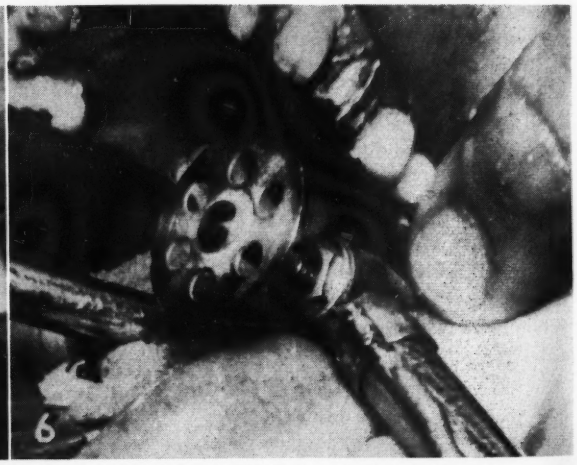
chisel. The two sides of the slice are sprung carefully in such a way as to fracture the cement, allowing the bridge to be removed with comparative ease.

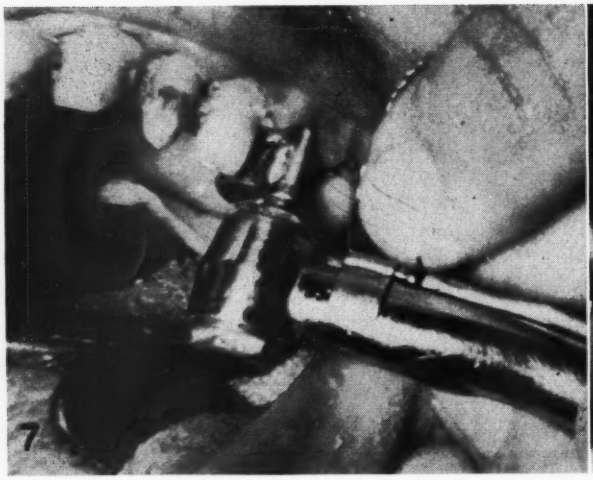
Figure 7—Diamond points have been changed. A long tapered cylinder is used to go under the gingival of the bicuspid veneer. The bridge is completely removed and the preparation of the abutment teeth follows.

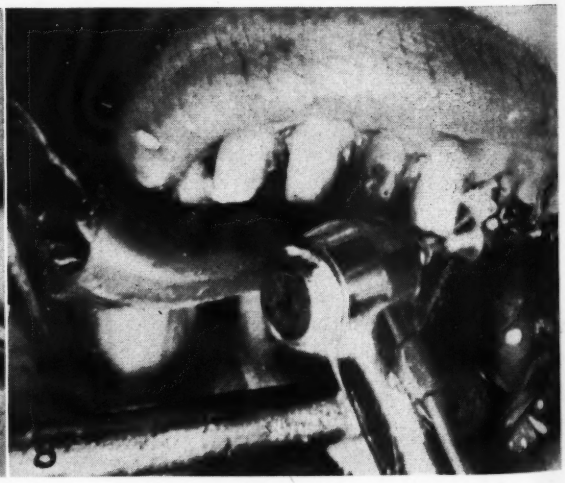
Figure 8—The diamond instrument has been changed to an inverted cone with face-cutting surface. This allows penetration above the gingival without danger of striking the adjacent tooth. As the anterior teeth have already been prepared care must be taken not to damage the preparation of the cuspid which is directly in front of the abutment for this bridge.

Figure 9—Slices have been made in the face of the veneer crown. With the









removal of these crowns and the preparation of the teeth previously covered by them, the upper arch is completed. Preparation can now be begun on the lower arch.

Figure 10—In this view the operator has turned completely around and is facing the camera. This position gives him direct vision of the lower arch. The neck microphone can be seen taped across the operator's chest.

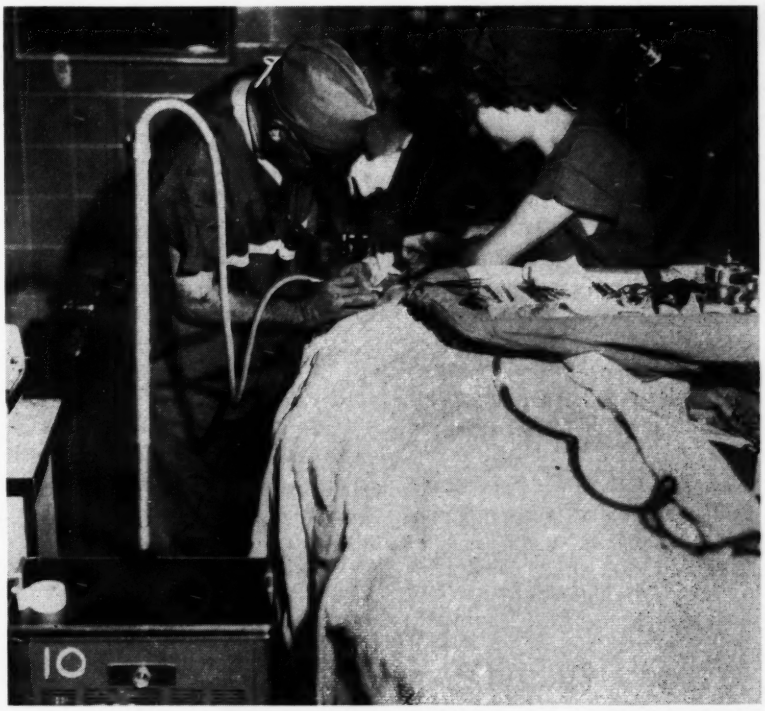
Figure 11—Note that a 3/4-inch outside cutting saucer shaped diamond is now being used for distal slices on the lower preparations. For the mesial slices a Safeside 3/4-inch diamond wheel is used.

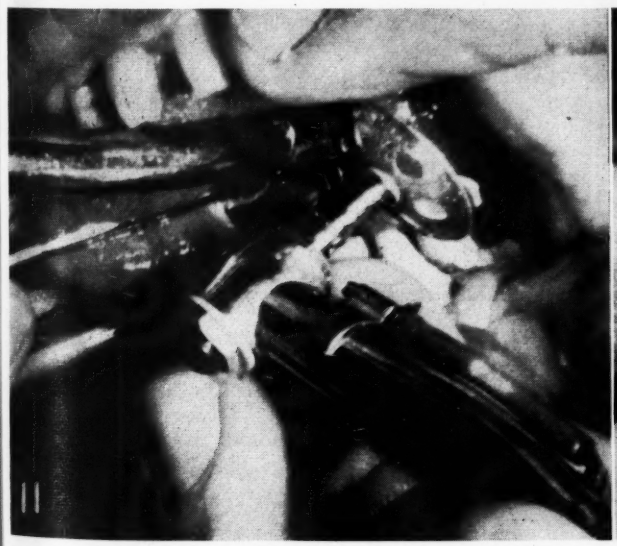
Caution Required—With the use of

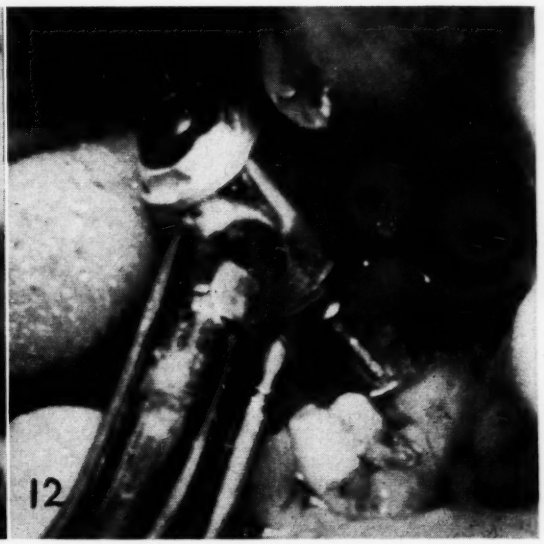
Dentistry Under General Anesthesia

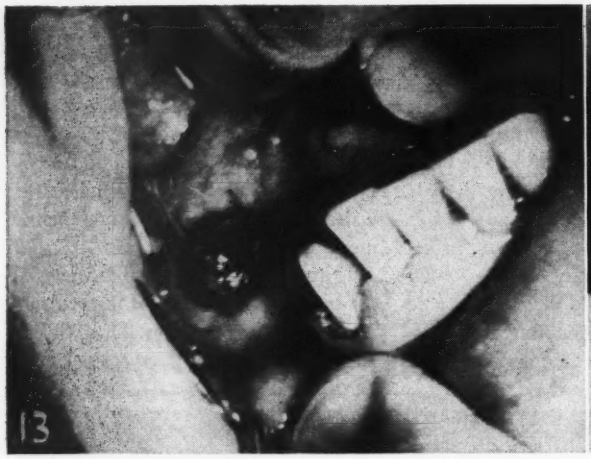
Conservative dentistry under general anesthesia is of great benefit to a large number of people. The actor, the public speaker, the business executive, may have their treatment completed in one session without being aware of being treated. There are many cases in which this is the most desirable thing to do; it is more economical than recalling the patient a dozen times for half an hour at a time. If the operator applying the anesthesia is experienced in the technique there is no disadvantage whatever, and as far as I know there has never been a death in this country from this mode of procedure.

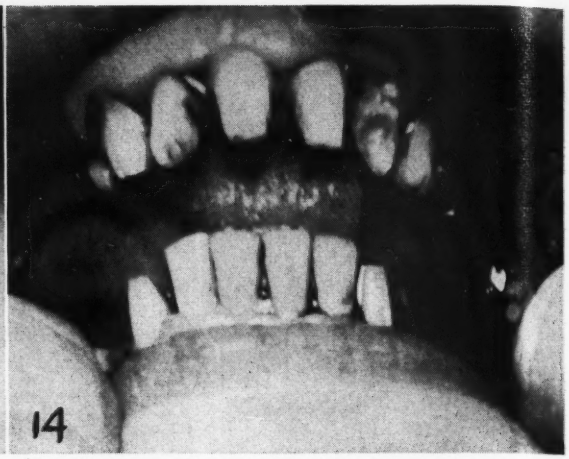
From a Report before *Society for the Advancement of Anesthesia in Dentistry*, November 20, 1958.











¾-inch diamond wheels on a contra-angle handpiece it is necessary to be extremely careful of the patient's tongue and lip. The danger of contact is imminent and the resulting cut can be severe. Caution is the constant aim of every operator who attempts high speed preparation under general anesthesia.

Figure 12—Cylinder No. 24 is used for the lingual and buccal preparations of the lower crown preparations. This cylinder is about the size of a No. 560 bur.

Figure 13—The lower right second molar is shown after preparation was made. Note that the tooth has been treated with silver nitrate and is completely black. In this type of rehabilitation silver nitrate is used on every tooth on which full coverage is to be accomplished.

Figure 14—The finished preparation is shown of the 18 teeth in question. Note that the molars have all been treated with silver nitrate and are now ready to be covered with aluminum crowns. The anterior teeth will be covered with plastic crowns filled with silicate.

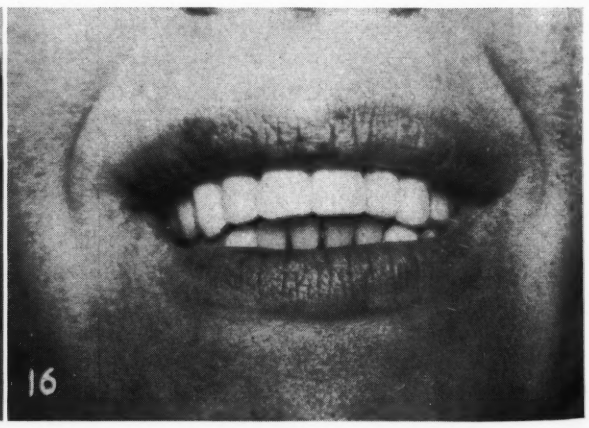
Figure 15—The case is shown as it was completed in the operating room with temporary full coverage on every tooth which was prepared to receive the permanent restorations.

Figure 16—The completed case is shown with the finished restorations on the posterior teeth and the finished veneer crowns on the anterior teeth.

Comment

The author believes that hospitalization and surgical techniques are imperative for the type of operation described here. Duration of anesthesia will be from 1 and ½ to 4 hours, depending on the kind and number of preparations completed. Anesthesia for this length of time is considered to be too extended for induction in the dental office.

716 *North Country Club*



The EDITOR'S *Page*

WHAT SHOULD the dentist know about medicine? The simple answer would be: more than he usually does know. Although the dentist makes his living from mechanical and surgical procedures he is performing these operations and making these restorations on human, living tissues.

Whenever human tissues are involved the biologic and medical fundamentals must be considered. Although engineering principles and their mechanical application are applied in most dental procedures the operations are being executed on animate tissue rather than upon inanimate objects. The success or failure of any dental treatment or restoration is, in part, dependent on mechanical precision. In another part, the outcome of the mechanical execution is entirely out of the hands of the human being (the dentist) who performs the operation. The biochemistry of the blood and saliva; the degree of susceptibility of tissue to pathogens; the response of tissue to irritation, trauma, and stress—these are *biologic* events and are to a limited degree only amenable to control by human beings. "Man the Unknown" to whom Alexis Carrel referred is still much with us and among us.

The dentist who wishes to see his patient in the totality of his personality and to treat his dental disease within the framework of the organism-as-a-whole must keep himself informed of developments in the field of medicine. Such a dentist cannot rely on information that he acquired years ago or that has more recently come to him by hearsay from a medical colleague.

The dentist must be prepared to study just as assiduously as any other person who makes claim to the professional tradition. Lack of time may make it inconvenient for the busy dentist to read original articles. It should be a function of dental journals to digest some of this original information and make it available to the dentist in brief and meaningful form. That is the intended purpose of the specially prepared department in this magazine, *Medicine and the Biologic Sciences*. Editorial surveys have shown that this department is popular.

As examples of medicine-in-dentistry two recent inquiries submitted by readers to the *Journal of the American Medical Association*[1] may be cited. The answers are as important to dentists as to physicians.

What management should be given patients who are receiving anticoagulant therapy should they require oral surgery? The answer was:

"Patients on anticoagulant therapy will show a strong tendency toward prolonged hemorrhage. This risk must always be considered when oral surgical procedures are contemplated. It is little appreciated that blood loss during some oral surgical procedures is comparable with that occurring in major surgical procedures. Experience at the New York Veterans Administration Hospital indicates that anticoagulant drugs be withheld before dental operations (Ziffer and others, *New England Journal of Medicine*, 256:351, 1957). Prompt resumption of therapy when hemostasis has been obtained will result in minimal interruption of anticoagulant therapy. The patient's oral surgeon and physician, or cardiologist, should determine after consultation the treatment plan for the individual patient relative to the cessation of anticoagulant therapy and/or vitamin K administration. The oral surgeon should not assume the responsibility for the discontinuance of anticoagulation therapy."

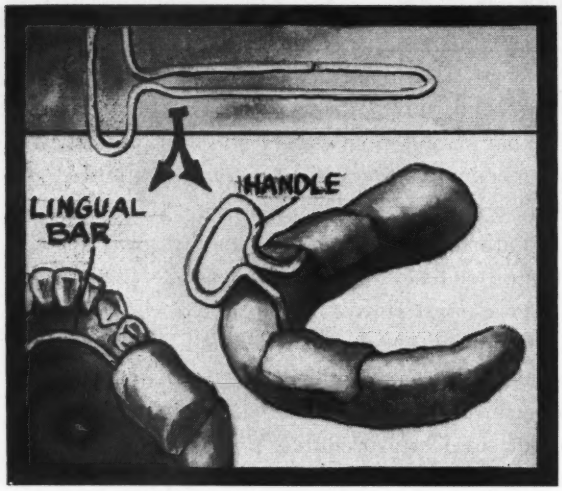
The second query concerned the efficacy of vitamin C from natural sources compared to vitamin C from synthetic preparations. The answer:

"Vitamin C is a specific chemical entity, and, therefore, the body is unable to differentiate between sources of this chemical (ascorbic acid). Whether the body obtains its vitamin C from synthetic ascorbic acid or from orange juice, the manner in which this substance is utilized by the body is exactly the same. . . ."

The following quotation, taken from the book "Modern Nutrition in Health and Disease" by Wohl and Goodhart (Philadelphia, Lea & Febiger, 1955) sums up quite accurately the current concept of the role of vitamin C:

" 'Large doses of ascorbic acid have been used by many surgeons in their postoperative patients in order to facilitate the healing of surgical wounds. This idea was based on the observations that stress situations like surgical operations and severe burns about the body lowered the serum ascorbic acid level and that ascorbic acid concentrated in the connective tissue about healing wounds."

[1]Questions and Answers, JAMA **168**:281 (Dec. 13) 1958.



1

Clinical and Laborator

Tray Handles

Charles A. Weaver, D.D.S., Gulfport, Mississippi

1. The keys from impression paste tubes make suitable handles for impression trays, strengtheners for upper, lower, and partial bite blocks.

2

Soap Holder

Jean McLaughlin, Phoenix, Arizona

2. Invert a surgical handbrush and use it for a soap holder. This keeps the soap from becoming soggy.

3

Incision for an Impacted Third Molar

Arthur M. Hartman, D.D.S., Sherman Oaks, California

3. Remove a small triangular wedge of tissue distal to the second molar and carry the incision around the second molar. This will permit greater visibility and accessibility to the impacted tooth.

READERS Are Urged to Collect $10.00

For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay $10 on publication.

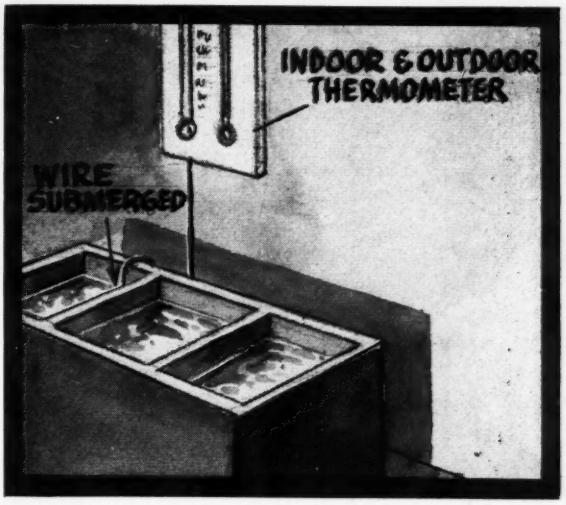
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

SUGGESTIONS . . .

Thermometer for X-ray Processing Tank

Francis H. Wright, D.D.S., Homewood, Illinois

4. To determine the temperature of the solutions in an x-ray processing tank use an indoor-outdoor thermometer. The thermometer is hung above the tank and the "outdoor" wire is submerged in the tank.

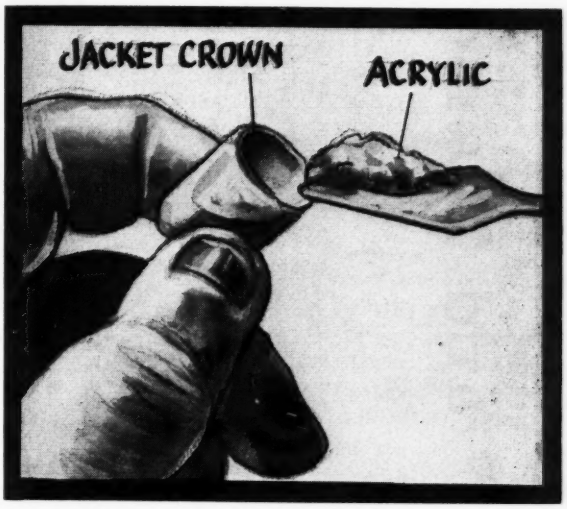


4

Acrylic to Hold Jacket Crown on the Preparation

Manuel Sakarya, D.D.S., Kayseri, Turkey

5. An acrylic jacket crown is better retained on the tooth if self-curing acrylic is used instead of cement. By this method it is also possible to secure a better match in shade.

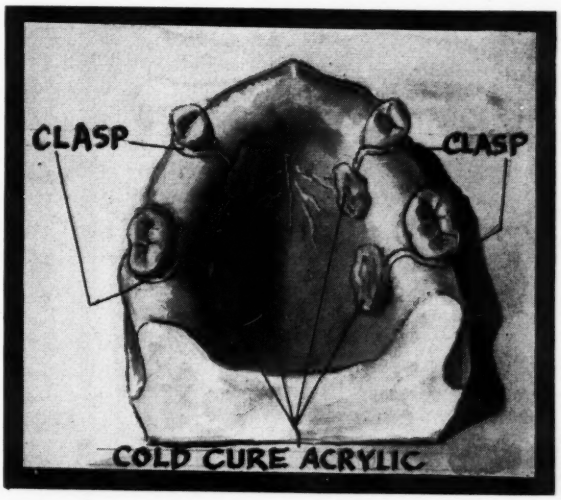


5

To Hold Clasps and Rests in Position While Processing

Rae Dinsdale, Hamilton, North Island, New Zealand

6. Fasten the clasps to the model with self-curing acrylic. This prevents the clasps from moving during boil-out and packing.



6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time. Turn to page 121 for a convenient form to use.

Send your ideas to Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

FG CARBIDE BURS
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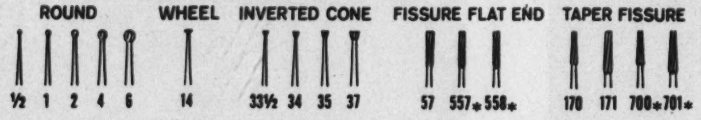
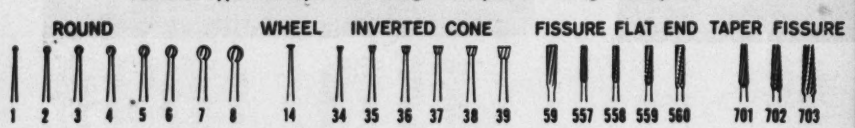


For Latch Type and Taper-Shank Angle Handpieces & Straight Handpiece



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MEDICINE and the Biologic Sciences

Peptic Ulcer

If conventional treatment is effective, gastric ulcers heal in an average of six weeks. Duodenal ulcers probably close in about the same time but are more difficult to appraise radiologically. The crater size and rate of healing are roughly correlated. The methods of medical treatment may be evaluated by studying the effect of the drug or regimen on healing rate.

The determination of the influence of drugs upon gastric secretion is also helpful. Therapeutic measures, however, designed solely to reduce gastric acidity probably are not adequate. Frequently ulcers heal spontaneously or when only small doses of antacids and frequent feedings are prescribed. Also gastric ulcers usually are not associated with hyperacidity.

It is often difficult to differentiate malignant lesions from ulcer craters located on the vertical portion of the lesser curvature or on the anterior or posterior wall of the stomach. If a patient does not have achlorhydria, gastroscopic and cytologic examinations may allow early diagnosis of cancer.

The most reliable indicator is the rate of healing. If the lesion diminishes to one-half or less of the original size after three or four weeks of treatment, the medical regimen is continued. Complete return of the stomach to a normal radiologic appearance usually signifies a benign ulcer.

Benign and malignant lesions of the antrum also appear similar in roentgenograms. Carcinoma in this location is common, but prognosis after resection is relatively good.

Most patients with ulcers also have recurrences. Gastric or duodenal ulcers recur with conservative management about once every two years. Treatment should then be resumed promptly. Those patients with poor symptomatic response to treatment and persistent epigastric pain have recurrences about once a year.

Prognosis for persons with repeated hemorrhage is also poor. Among patients with duodenal ulcers, the average incident of recurrent severe bleeding is once every six years after the first hemorrhage and once every three and one-third years after 2 hemorrhages.

Flood, Charles A.: Medical Management of Peptic Ulcer, Am. J. Gastroenterol. **27**:457-470 (*May*) 1957.

Herpes Zoster

The virus responsible for herpes zoster closely resembles the virus of chicken-pox as seen with the electron microscope. A close relationship of these viruses is also suggested by the occurrence of chicken-pox after injection of fluid from fresh vesicles of herpes zoster. The incubation period of herpes zoster is probably about seven to fourteen days.

Herpes zoster is an acute, self-limited disease. The incidence of the condition increases with age. The frequency of infection is not influenced by season, climate, sex, or race.

Cutaneous, nervous system, and systemic symptoms may occur. Erythematous papules involve one or more dermatomes. Within twelve to twenty-four hours, vesicles form; pustules usually appear within seventy-two hours. The surrounding erythema then subsides. Often, the vesicles first appear over the proximal portion of the involved nerve root, then spread distally. The thoracic region is most frequently affected.

Severity and duration of the infection are directly related to the number of days on which new vesicles continue to appear. In about one-fourth of patients, vesicles appear within twenty-four hours and the eruption disappears within thirteen days. In another 40 per cent, vesicles appear for forty-eight hours and require fourteen to sixteen days to clear. If vesicles continue to form for as long as a week, the eruption may persist up to five weeks.

The infection tends to be more severe and prolonged in old patients. Skin lesions disappear within fourteen days in over 90 per cent of patients under 20 years of age, but in only about 50 per cent of those 40 to 59 years of age.

Site of the lesions also appears to be related to age. In all age groups, the virus has a predilection for the thoracic and lumbar areas. Involvement of other areas is more frequent in old than in young persons.

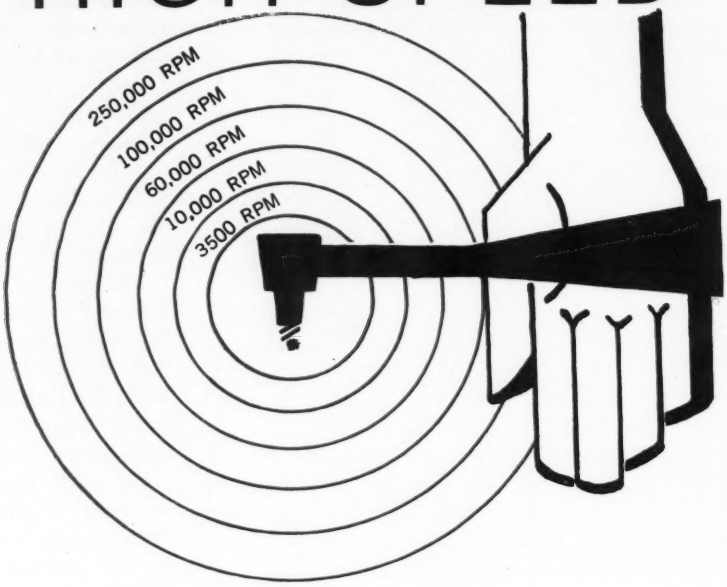
Pain, the most common manifestation of nervous system involvement, may precede, accompany, or follow appearance of skin lesions. Discomfort is described as pruritic, stabbing, burning, or aching. It may be constant or intermittent.

The systemic symptoms include headache, malaise, stiff neck, temperature elevation, and regional lymphadenopathy. Systemic reactions are most common in pediatric patients. Herpetic involvement of the ophthalmic branch of the fifth nerve occurs in almost one-fifth of cases; conjunctivitis, iritis, keratitis, or extraocular muscle paralysis may ensue. Postherpetic neuralgia, the most common complication, occurs in about 10 per cent of patients, being most frequent in old persons.

Burgoon, Carroll F.; Burgoon, Jane S.; and Baldridge, G. Douglas: The Natural History of Herpes Zoster, JAMA **164**:265-269 (*March* 21) 1957.

(*Continued on page* 133)

HIGH SPEED



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Tumors of the Brain and Spinal Cord

The primary sites of carcinoma metastatic to the central nervous system are the lung and bronchus, breast, and gastrointestinal tract. Metastasis to the brain is four times as frequent as spread to the spinal cord.

The usual location of metastatic deposits in the brain is one or both of the cerebral hemispheres. Involvement of the cerebellum is much less frequent. Usually more than one lesion exists but solitary deposits are found in about 37 per cent of patients. Metastatic lesions of the spinal cord are generally extramedullary and extradural. Ordinarily, only one metastatic lesion will affect the spinal cord.

The most common manifestations of brain metastasis are headaches and seizures. If a patient is known to have had carcinoma, metastasis to the brain is the most likely cause of such symptoms. By neurologic examination, the tumor may be localized and the number of lesions determined. Angiograms or pneumoencephalograms are not usually helpful because the metastatic foci are often notably small. Skull roentgenograms may be normal if metastasis affects the brain but not the skull.

With metastasis to the spinal cord, pain and weakness are common. Myelomalacia occurs with lesions above the level of the caudia equina. Lower tumors cause severe pain. As with brain metastasis, overlying bone is often unchanged.

Metastatic lesions of the brain or spinal cord may be asymptomatic, being discovered only by postmortem study. In other instances, neurologic symptoms due to a metastatic lesion appear before evidence of the primary tumor; biopsy is necessary to make the diagnosis of carcinoma. The primary tumor may be revealed only by extensive investigation.

When a solitary accessible brain tumor is detected some time after removal of the primary tumor, surgical treatment should be considered. If the patient is thought likely to survive for one or two years, craniotomy is probably justified. The decision, however, must be made jointly by the physician, the patient, and the family.

Removal of a metastatic lesion in the spinal cord above the level of the cauda equina is not advisable because the associated myelomalacia is irreversible. For lesions below the cauda, excision is sometimes beneficial. Usually, however, the rootlets in this region are infiltrated by carcinoma. If intractable pain exists and life expectancy warrants operation, bilateral chordotomy or frontal lobotomy may be performed.

Although disease is often rapidly progressive, some patients survive for a year or more after the central nervous system lesion has been recognized.

Alpers, Bernard J.: Some Clinical Problems of Metastatic Carcinoma to the Brain and Spinal Cord, Chicago M. Soc. Bull. **59**:1031-1036 (*June*) 1957.

(*Continued on page* 136)

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The new Dentalair Unit has all the features necessary for modern dentistry—yet performs every operative procedure in strict classical manner! No new techniques to learn—there's no need for "stroking" or "brushing," since both torque and speed are controlled by a touch of the finger. Dentalair provides full, normal tactile perception at all times, especially important when visibility is limited.

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For Dentists
and Physicians

How to sharpen your DIAGNOSTIC SKILL

The information from a shelf of textbooks has been compressed into the easily-read, rotating diagnostic chart, ORAL DIAGNOSTIC SIGNS. Use of the chart will save you hours of searching through reference material.

The mouth is a mirror that reflects the manifestations of many systemic diseases. One hundred of these system diseases are included on ORAL DIAGNOSTIC SIGNS. The lesions that may appear on the lips, buccal mucosa, tongue, gingiva, and palate are described on the chart.

The dentist encounters lesions of the mouth that should alert him to consider diseases of nutritional or hormonal imbalance, of malignancy, of bacterial or viral origin. In such cases, the dentist should refer the patient to the physician for more thorough examination and treatment. The physician observes lesions of the mouth that may be of mechanical or local infective origin. In such cases, the physician should refer the patient to the dentist for definitive treatment.

The dentist, because he often sees the patient before the physician sees him, has the opportunity to become an important member of the health team by detecting the early expressions of systemic disease. Early detection and treatment of these conditions will save lives!

Every dentist and physician—whatever his specialty or field of particular interest—should have a copy of this important diagnostic aid! Send for your copy today!

ORAL DIAGNOSTIC SIGNS has been prepared by Edward J. Ryan, D.D.S., Editor of Dental Digest, and E. Cheraskin, M.D., D.M.D., Professor of Oral Medicine, University of Alabama.

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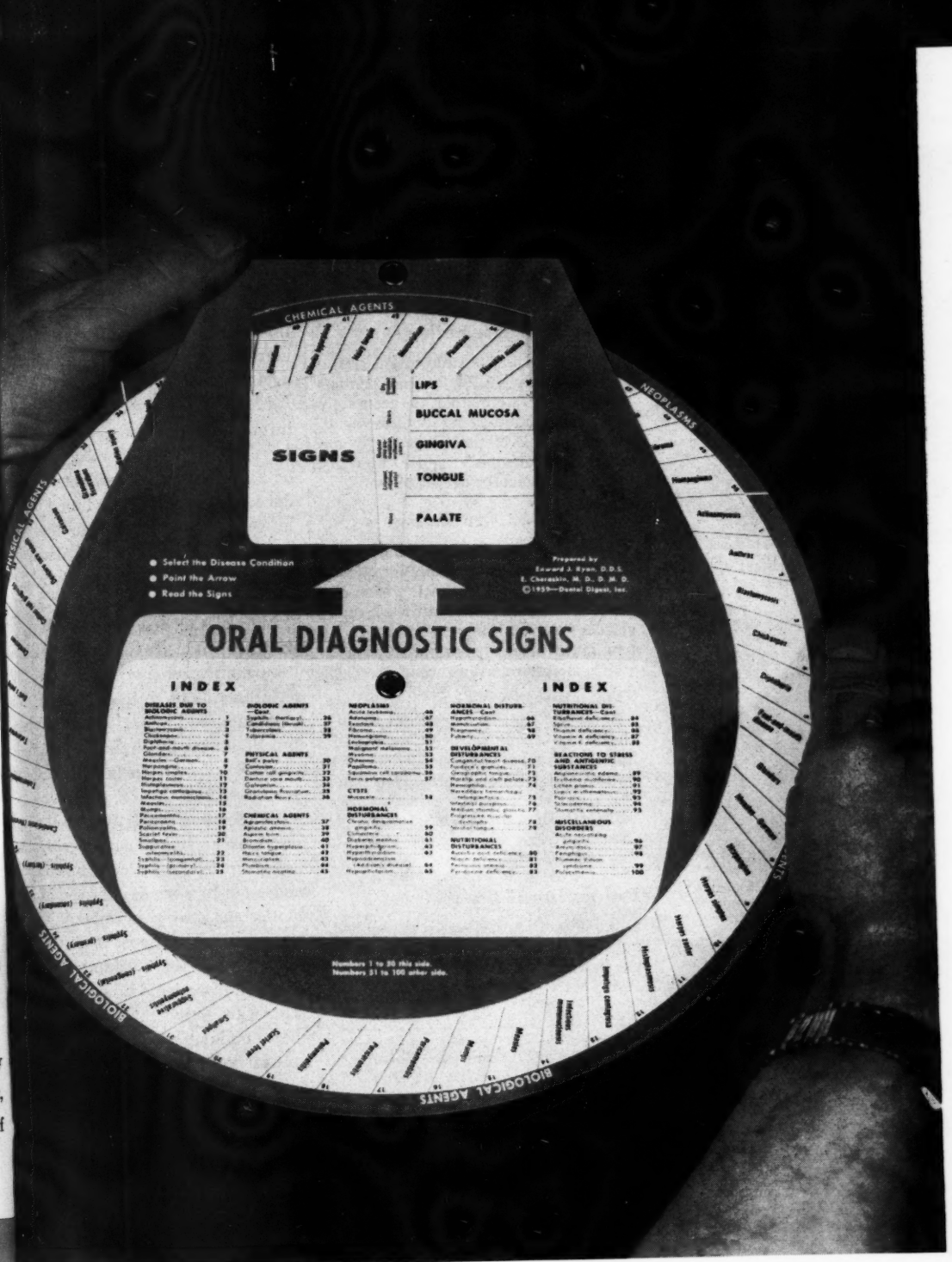

100 *diseases are classified under these ten categories on the chart*

1. Diseases Due to Biologic Agents
2. Physical Agents
3. Chemical Agents
4. Neoplasms
5. Cysts
6. Hormonal Disturbances
7. Developmental Disturbances
8. Nutritional Disturbances
9. Reactions to Stress and Antigentic Substances
10. Miscellaneous Disorders

Advertisement

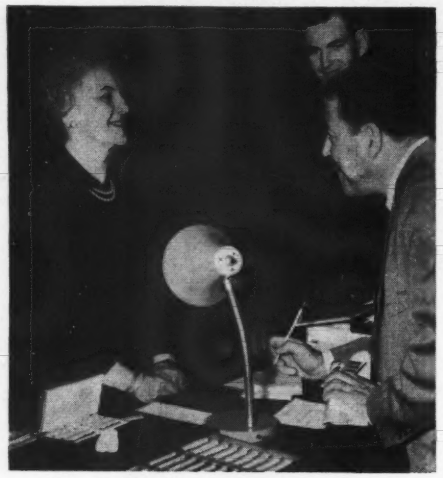

Fig. 1. Dentist examining patient at close range during detectability test.

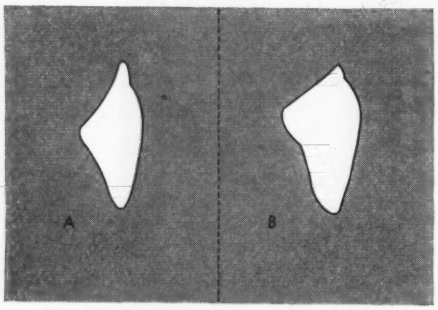

Fig. 2. Dura-Blend now offers choice of profile: (A) Characteristic of new moulds; (B) Typical of many existing moulds.

Fig. 3. New Dura-Blend shade guide has three additional shades. Rugged plastic handles are designed for maximum convenience in matching.

New Moulds New Shades in Dura-Blend

Tested for Detectability

In a series of tests at important dental meetings only 10.7% of the dentists participating were able to accurately distinguish Dura-Blend anterior teeth from natural teeth. Such teeth are clearly undetectable under ordinary conditions. Send for details of test.

New Moulds, New Shades

Thirteen new moulds have been added. Ten upper moulds originally introduced with Myerson's AEsthetic porcelain teeth offer more subtle labial carvings, slender forms and longer ridge lap. Three new lower moulds, short in relation to width, increase convenience in selection.

Three new shades, M61, M65, M69, have been added to increase Dura-Blend's shade-matching superiority. M61 is quite light and bright, M65, similar but darker, and M69, quite grey. New shade guide proved first choice in match to natural teeth 44 percent more often than the shade guide which scored second in this respect.

Proven Durability

Durability of Dura-Blend is unequalled, as proven in over ten years of successful use in hundreds of thousands of cases.

Write today for new Shade Guide and new Mould Chart. Address:

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Hamilton Street, Cambridge, Mass.

Antibiotics in Geriatrics

In general, there are three main factors which determine the success of antibiotic therapy. These are (1) selection of a drug effective against the infecting organism, (2) adequate concentration of the drug at the site of infection, and (3) maintenance of drug concentration for an adequate period of time.

To assure correct choice of antibiotic, accurate diagnosis, including determination of antibiotic susceptibility, is essential. Symptoms of infection may be slight in old persons. Often the lack of symptoms causes delay in seeking medical advice and the infection is far advanced when the patient is first seen. Symptoms may also be masked by therapy with adrenal steroids or other drugs. Trial-and-error therapy is not permissible for establishing infections in old persons. Bacteriologic sensitivity must be determined to select the suitable antibiotic. If necessary, combined streptomycin and penicillin may be given until these studies are complete.

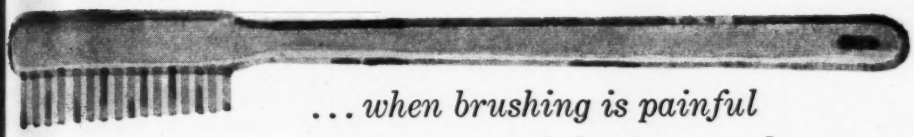
Administration of antibiotics because of a subjective impression of infection is unjustifiable, as is the regular use of such drugs as prophylaxis against the common cold.

Most antibiotics are excreted through the kidneys and liver. Therefore, blood levels of antibiotics may be higher in elderly patients with reduced renal and hepatic function than in younger persons given the same dose. If renal or hepatic disease is superimposed upon normal functional loss, variation in peak blood concentration of the drug and in duration of therapeutically effective levels is even more pronounced. Periodic determinations of antibiotic serum concentration and of various physiologic functions may be desirable as guides to dosage, particularly if therapy is prolonged.

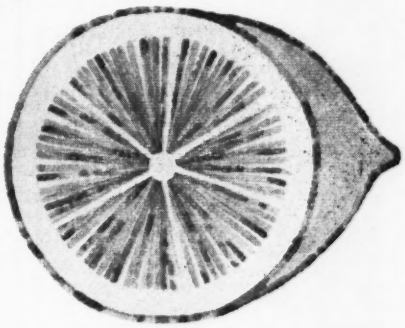
Fulminating infections in which the normal inflammatory responses are not providing protection, may be alleviated by concomitant use of antibiotics and steroid hormones. The infecting organism must be susceptible to an available antibiotic. Careful selection of patients is necessary. Persons with active tuberculosis, peptic ulcer, major emotional upsets, widespread dermatitis, or myocardial insufficiency should not receive the combined therapy. Steroids reduce the effects of some antibiotics and combinations must be carefully selected. Frequent laboratory tests are necessary during combined therapy.

Disturbance of intestinal bacterial flora may cause partial avitaminosis which may be particularly serious in elderly patients with preexisting subclinical malnutrition and with infections. So-called stress-fortified antibiotics, which provide the total known vitamin and accessory factor requirements as well as minerals, should probably be used for geriatric patients.

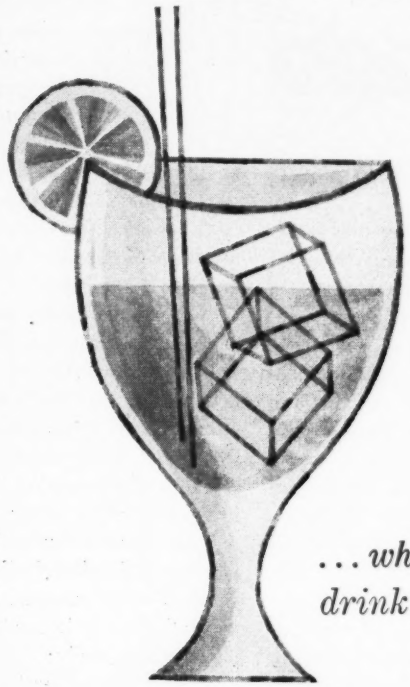
Pratt, Robertson: Antibiotics in the Elderly Patient, Geriatrics **12**:345-349 (*June*) 1957.



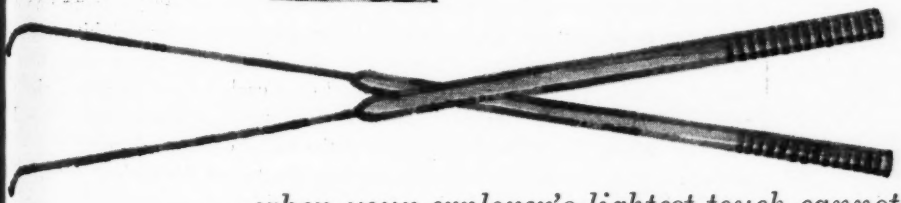
. . . when brushing is painful and poor mouth hygiene results



. . . when acid fruits are not fully enjoyed



. . . when hot or cold food and drink cannot be tolerated



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1. Abel, I.: Oral Surg. *11*:491 (May) 1958.

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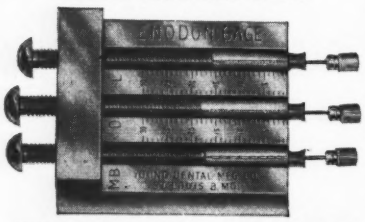
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How Clean Does Your Office Grow?

With the present scrutiny that is being given to the persistent strains of penicillin-resistant staphylococci in the hospital environment several enterprising investigators thought it time to take a critical look at the bedside water container in the hospital. This ubiquitous pitcher was found to harbor slime, algae, coliform organisms, and staphylococci. These findings were published in the highly respected *New England Journal of Medicine* and set down there with commendable bluntness.

"Patients' complaints of unpalatable bedside water called attention to the potential hazard of bedside drinking water as an unappreciated vehicle in crossinfection in hospitals. Inspection of patients' water carafes in several hospitals revealed turbid, malodorous water in a majority of cases . . .

"The bedside water supply in 24 hospitals was shown to contain high densities of coliform organisms and staphylococci.

"A survey of the management of bedside water is analyzed, and the eight parameters that determine its quality are presented.

"The factors responsible for contamination of carafes are reviewed. The carafe is documented as a potential vehicle for crossinfection.

"The program recommended for providing a safe supply of bedside water includes: proper installation and operation of ice-cube makers that are isolated from sources of bacteria shed by patients and personnel; automatic bagging of ice cubes and storage at temperature less than 20 degrees Fahrenheit; dispensing of ice cubes from refrigerated dispensers with ice tongs; provision of carafes with wide mouths to facilitate cleaning, inspection, and filling; daily sanitization of carafes with heat; processing of carafes in the diet kitchen by personnel trained in food-handling precautions; and complete emptying and refilling of carafes from the tap each time they are serviced.

"A bacteriologic quality control program must be instituted in the hospital to assure bedside water of a quality comparable to the drinking water supplied the community.

"Where melting ice is used, it must be dispensed from a solution of sodium hypochlorite.

"Much time is spent measuring and charting fluid balance. The quality as well as the quantity of this nutrient is of concern to the clinician, and the attention of administrators, architects, and public-health officials is called to this necessary improvement in the care of the patient."

What would a similar investigation uncover in the *dental* office? To mind comes several categories of instruments that might be subject to critical bacteriologic study:

1) What is the dentist doing about his supply of rinse and drinking water at chairside? Are paper cups used and does each patient receive a clean one? Or are glasses used and changed at the whim of the assistant?

2) What does the patient see when he peers into the vortex of the cuspidor? Residue of blood and salivaborne debris with an occasional hairpin or cigarette stub entrapped in the plumbing?

3) What attention is given to the instrument bracket-table? Are clean paper covers used between every patient?

4) The newer types of handpieces are beautiful examples of the skills of the engineers and welcomed addition to the armamentarium of the dental office. What would they reveal on bacteriologic examination? Or the older types of handpieces?

5) It may be indelicate to speak of the sludge that collects in the hair of some people and of the bacteria that flourish there, but the dentist should make certain that every pa-

(*Continued on page* 140)

SUPERIOR TO ASPIRIN OR BUFFERED ASPIRIN...

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The widespread acceptance of Anacin Tablets by the profession is overwhelming evidence of their safety and effectiveness. The rationale may be simply explained: Anacin is superior to aspirin or buffered aspirin. Medical literature substantiates that a *combination* of ingredients is better tolerated, is more effective and smoother in action than equivalent doses of any one used individually.[1,2,3] Anacin is such a formulation. One ingredient in particular (acetophenetidin) exerts more selective sedative action and is efficacious in diminishing apprehension and tension as well as affording rapid and prolonged analgesia.[4] Excellent tolerance. Preferred by more dentists than any other analgesia.

References: 1. Goodman, Louis S. and Gilman, Alfred: *The Pharmacological Basis of Therapeutics*, sec. ed. 1955. 2. Krantz and Carr: *Pharmacologic Principles of Medical Practice*, 1954. 3. Hammes, E. M., Jr.: *Pain-Relieving Drugs*, J. Lancet, 79:67, Feb. 1952. 4. Wolff, Harold G.: *Headache and Other Pain*, Ox. University Press, 1948.

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tient has a fresh surface upon which to rest his head while he sits in the dental chair.

6) How about the tips of spray bottles? Are they sterilized between each patient? And does anybody do anything about the tubes and belts that are part of the dental unit?

7) From his point of vantage in the dental chair, and with nothing else to hold his attention, the patient may be a dust-searcher. Dust is associated with uncleanness, uncleanness with bacteria, bacteria with disease.

Every dentist can add to this list of objects in the dental office that may be breaks in the chain of asepsis. You can be sure that many patients have their own lists!

We now know that the "wonder" drugs that have saved thousands of lives also have a menacing side to their nature. Living microorganisms, like human beings, build up tolerance to antibiotics. Bacteria are also in the struggle for survival. They become resistant and are more powerful when they are attacked. The incidence of infections in hospitals is rising because of the emergence of penicillin-resistant strains of staphylococci. As more and more people receive penicillin and as more people handle this antibiotic the resistant bacterial strains become more powerful. In time and in the biologic struggle the same thing will develop toward other antibiotics. These vicious strains attack the debilitated, the postpartum, the new born, the person recovering from surgery—the people who can least tolerate such insult.

Virulent stapholococci may flourish in the hospital environment because here is where most people who are in lowered resistance and are receiving penicillin are to be found. Here, too, are the people who are handling the drug and are carrying the resistant strains and playing host to them in their own bodies. These people may not be sick, but they are passing the bacteria along to the hospital patients who are not in position to resist such invasion. The result: serious infections among hospital patients.

There is no alarm system that sounds when these resistant bacterial strains decide to wander outside the hospital surroundings. They cannot be seen with the naked eye or heard by the human ear. They take up residence in the warm, moist, dark tissues of the nose and throat of people who are not themselves ill. They are coming into the dental office and may be harbored in the tissues of the dentist himself. It is not a pleasant picture, but it is a real one.

The public is not generally aware of the most fundamental facts of bacteriology. Although the medical literature carries many articles on the dangers from these vicious stapholococci the evil has not yet been explained to the public. Perhaps that is just as well. Panic might result among the public and confidence might be lost in hospital methods and management.

Physicians and hospital administrators are attempting to meet the threat head-on. In virtually every hospital the danger is understood and corrections in techniques are being made. Can we say the same about the dental office?

The private domain of the dentist, where he rules as the Little King, is not subject to the same supervision that is made in the hospital despite the fact that the dentist also operates on human tissue. He injects into tissue, he draws blood, he exposes bone and by so doing enters the internal milieu of the body.

Unlike the hospital discipline we dentists do not offer the safeguards *to the public* of staff meetings, careful case records, committees to evaluate tissue that has been removed at surgery, autopsy protocols to check diagnosis, or even the scuttle-butt that passes back and forth in the hospital that reflects opinions on the management of patients. To be sure, grievous errors in judgment and calamities in treatment are made in hospitals, but they are not long buried in secrecy from other members of the hospital staff. The physician and surgeon performs in the hospital under the scrutiny of his peers. This is not true in dental practice.

Some dentists will not like these blunt words. Better though, that they be said by another dentist than by a critic from outside the profession.

No purpose is served by emphasizing a negative position. As a constructive suggestion: I would like to see a bacteriologic examination made of 100 dental offices, selected at random, to determine if the same con-

ditions (or worse) exist there as were uncovered in the bedside drinking water containers in the 24 (Massachusetts) hospitals.

Is it not better to examine and correct our own shortcomings in methods and procedures than to have change forced upon us by the heavy hand of legislation?

—E. J. R.

Systemic Versus Local Factors in Coronary Artery Occlusion

RUSSELL L. HOLMAN, M.D., WILLIAM F. ENOS, JR., M.D., JAMES C. BEYER., CAPTAIN (MC) USA, and WILLIAM C. MANION, M.D.

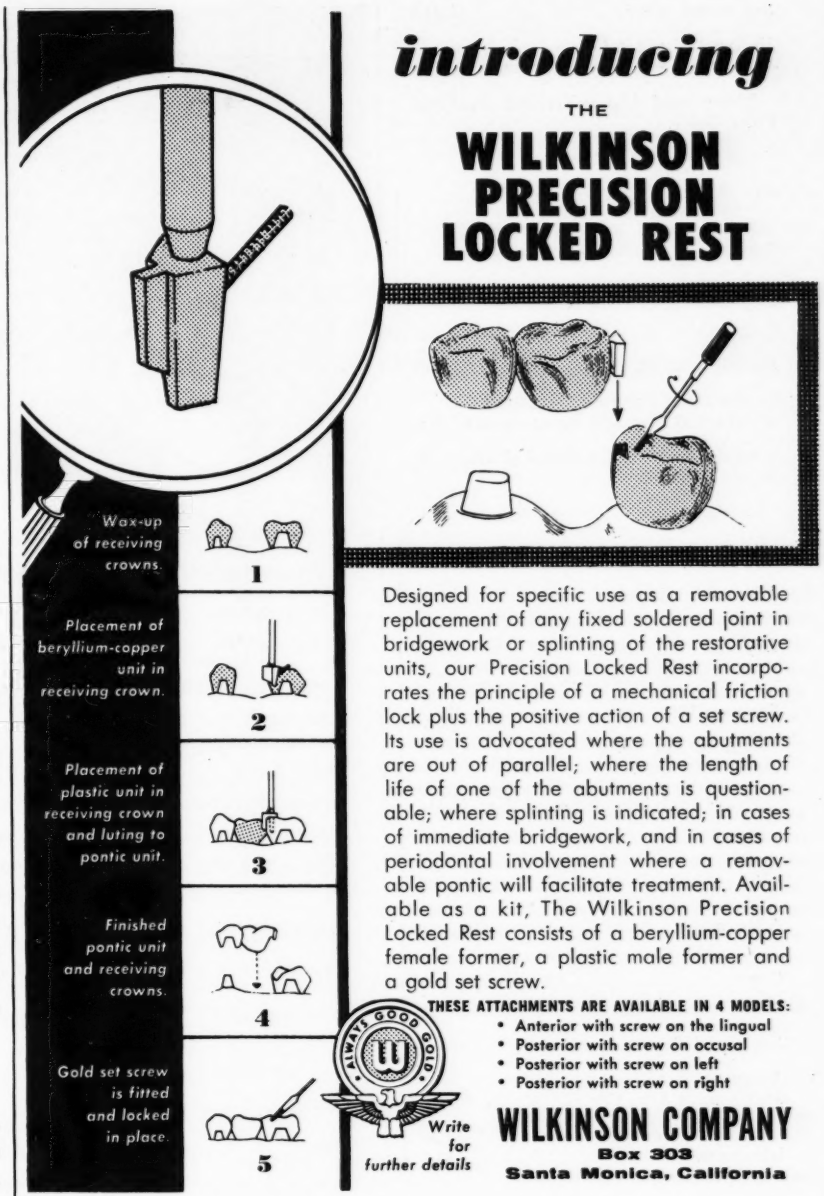
Previous Studies Extended

How can an atheromatous plaque exist for years and decades, then undergo changes that may result in fatal disease, sometimes causing death within a matter of minutes? The almost universal prevalence of atheroma is attested by recent investigations which show that every person beyond the age of three years has atheroma of some degree in the aorta, and that by the end of the second decade over three fourths of all persons have some atheroma in the coronary arteries.

Basis for Investigation

In the succeeding decade or two, pearly plaques become the rule in both the aorta and coronary arteries. Yet, decades may go by before complications ensue, and in about half of the population no known disease referable to atherosclerosis manifests itself during the life span. What then precipitates disease? Is it a metabolic tide of systemic origin or a purely local circulatory disturbance such as vasoconstriction? It was reasoned that if it were the former, similar changes would be found around pearly plaques in other parts of the body, whereas if it were the latter, such changes would be absent.

Adapted from *United States Armed Forces Medical Journal* 9:12 (Jan.) 1958.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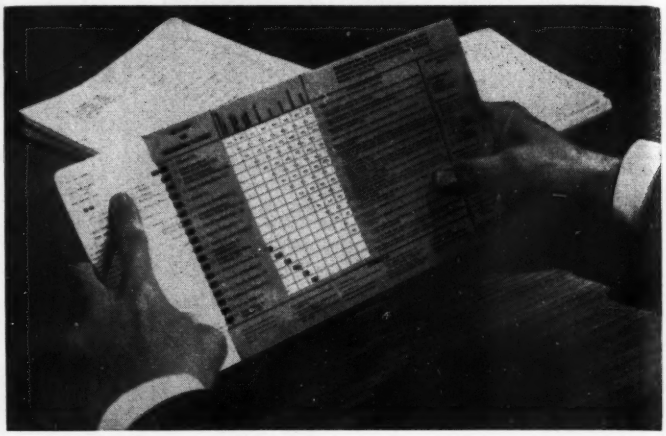

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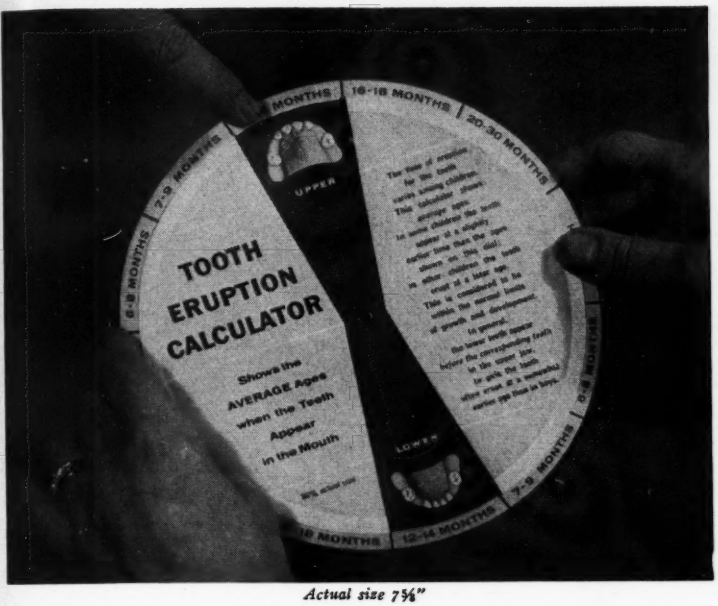

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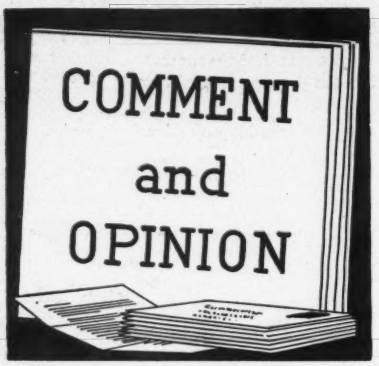

Honest Confession is Good for the Soul

Dear Editor: If it is true that "an honest confession is good for the soul" your article OUR FREQUENT MISTAKES in the current issue of DENTAL DIGEST (December 1958) should make many an honest dentist raise his hand and to himself say: Amen!

In fifty years of practice I can truthfully say that I have never completed a piece of dental work without seeing where (I thought) it could be improved and wish that I had done it a bit differently and vowed to improve the technique next time. Your honest article on this subject impressed me so favorably that I couldn't help writing this letter which is sent in a spirit of commendation purely.

C. W. Pratt, D.D.S.
Calumet, Michigan

Treatment of Aphthous Ulceration of the Mouth

Dear Editor: I was particularly interested in THE EDITOR'S PAGE in the November 1958 issue of DIGEST on the subject of the treatment of aphthous lesions in the mouth. In my practice the only treatment I have ever used for these lesions is ordinary sauerkraut juice as a mouthwash between meals. With this treatment the "canker sore" invariably disappears.

Sauer kraut juice seems to supply the slight lactic reaction necessary to the saliva. It is possible that the lack of a slightly acid reaction in the saliva is the cause of the aphthous ulcers. The patient is advised to use a wine glass full of sauer kraut juice between each meal. The sauer kraut may be swallowed after being used as a mouthwash. I have never seen this method fail. The sauer kraut may be discontinued after the ulcers disappear.

Leonard S. Morvay, D.D.S.
30 Central Avenue
Newark 2, New Jersey

To Err is to be Human

Dear Editor: I have just finished reading your department CONTRA-ANGLES in your December 1958 issue and find it extremely interesting. During the years that I have been practicing dentistry I'm sure that I must have made every error mentioned in your article in addition to quite a few of my own which you did not mention.

This is a wonderful article and I wish every dentist in the country would read it: if we would face up to our own mistakes we would not be so quick to criticize our fellow dentists, and this would build confidence in the whole profession.

Richard M. Ellis, Jr., D.D.S.
3506 Texas Street
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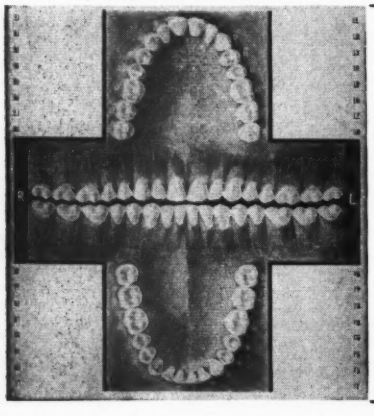

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